40 Rock

POPULAR Computing WEEKLY

35p 13 January 1983 Vol 2 No 2

This Week

Oric 1 exclusive
Tony Bridge presents the first review of the Oric 1, a low cost micro to rival the Spectrum and Vic20 See page 12

Battlestar
Win a ZX Spectrum in this unique play-by-mail computer moderated game. Full details on page 31

Dragon diary
Keith and Steven Brain present a diary program for 1983 that you can save on cassette See page 29

Spectrum melody
David Lawrence's melody-maker routine enables you to enter, correct and store tunes on the Spectrum See page 28

STAR
Animated Engine on BBC model B by Rey Morris. See page 8.
GAME

News Desk

BBC Buggy takes to the floor

THE BBC has unveiled its 'Buggy' robot vehicle designed for use with the BBC Model B microcomputer.

The three-wheeled Buggy is supplied in kit-form and, using only a screw-driver, is easily built into a versatile robot capable of a variety of tasks. The vehicle is about six inches square and is driven by two 12 volt precision stepper motors.

The simple robot communicates interactively with the BBC computer via a special interface unit supplied with the kit. The Buggy is directed from the computer but the

Continued on page 5

Software plan for Lynx

CAMPUTERS HAS set up a software company to provide program support for its Lynx microcomputer.

The new associated company — Camsoft Limited — will both develop software itself and commission material from other software houses.

The first programs released under the Camsoft label — planned for February — will be two educational cassettes to teach spelling and numeracy skills to school children.

Projects under development include a Data File handling Extension Pack — available on cassette, disc and Rom from mid 1983, a Graphics and Sound Extension Pack and an Advanced Structured Programming Pack.

Camsoft will develop the Lynx disc-operating system planned for April and software for Lynx teletext and Micronet 800 compatibility.

A Camsoft spokesman explained that the first independent software house to write material for the Lynx will be Softek

Classified

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SUPERBOARD UK101 610 memory, disc expansion board 8K Ram fitted complete with cable £100 ono Tel Basingstoke 51082 evenings

ZX81 Sinclair-built plus 16K Rampack, work station and software £65 Tel 01-657 2001 after 4 pm

16K RAM CARTRIDGE for Vic20 price negotiable Tel 01 981 7168 (evenings)

PART EXCHANGE TRS80 Model 1 level II fitted with advanced graphics inc s/ware Want Atari 800 preferably 48K Tel Work 01-388 1244 ext 4702. M R Metcalfe

COMMODORE PET 3001 inbuilt monitor + cassette + all programs and four books + Commodore computing magazines £200 ono Mr Brown 5 Equity Road East Earl Shilton Leicester

VIC20, six months old + cassette Adventure Land cartridge + others + about 12 cassettes £120 Tel Marshalls Cross St. Helens 816631

VIC20 + cassette unit one Adventure cartridge four games disc books £150 Tel Johnstone 23631 (Scotland)

EXIDY SORCERER 32K Time waster forces resale over £100 worth of software including Chess Defender Galaxians TRS80 conversion tapes ESC games, tape computer set ESC newsletters £295 Tel Ivy Bridge 4066

COMMODORE 4032 basic 4 0 32K super chip 4040 dual disc drives Epson MX80FT printer programs including word processor Commodore machine code editor assembler etc offers please will split. Tel Erith (38) 37437 evenings

DRAGON 32 3 months old boxed, including all cables and lead cassette recorder pair of joysticks £110 of software £225 00 Tel Preston, Lancashire 323148

BBC MICROCOMPUTER Model B as new condition complete with dust cover cassette lead two technical books (worth £19 alone) and over £100 worth of good software (there are 25 games in all) Also with original box packing and the Welcome Package software Total package worth over £925 new accept £365 No offers Contact Martin at Jardinet Oakland Park, Falmouth Cornwall

ZX81 plus DK Tronics keyboard and 16K Ram leads manual and power supply approximately 11 games tapes and many copies of Sinclair user manual £85 00 Tel Wallingford (0491) 35849

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★ ★ BATTLE STAR IS HERE ★ ★



13 January 1983 Vol 2 No 2

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Accuracy
Popular Computing Weekly cannot accept any responsibility for any errors in programs we publish, although we will always try our best to make sure programs work

This Week

Editorial

The US market for microcomputers has grown from almost nothing in 1975, when Steve Wozniak founded Apple in a garage in California, to an estimated $4 500m today By 1987 this market, which covers micros that cost anywhere between $100 and $10,000, could be worth as much as $18,500m

There are now approximately 150 different microcomputer manufacturers in the US This compares with less than 50 just 18 months previously

Sinclair, through its links with Timex, has already made inroads into the US market The Timex/Sinclair 1000, a 2K version of the ZX81, has sold in large quantities since its launch in September last year Further Timex/Sinclair machines are expected shortly

Acorn also plans to sell its range of BBC micros in the US, starting in the first quarter of this year (*Popular Computing Weekly*, November 4)

Leading software companies such as Artic, Quicksilva and Bug-Byte have also made arrangements to distribute their wares in the US

This is a trend to be encouraged, though companies should beware of overreaching themselves Exporting British micros, or arranging to have them built under licence can only create new outlets for British software

Next Thursday

Shahid Butt presents Flipside, a new type of game for the Vic20 Can you control the continuously moving ball and guide it round the screen within the time limit?

Also next week, John White looks at the history of micro chess

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Buggy fun

Continued from page 1

commands depend on information fed back from sensors on the Buggy

A bumper at the front, split into two parts, can detect an obstruction to the left or right Also at the front a Light Dependent Resistor (LDR) can sense if the Buggy is near a light source Underneath an infra red transceiver can follow a line on the floor or read information from special bar-codes There is also provision for additional sensors such as a pen or robot arm

Software supplied with the Buggy includes thirteen programs *Test* checks that it is correctly set up *Switch* demonstrates the main commands which drive it *Memory Switch* stores the path selected manually from the computer *Snail* allows a route to be planned from the screen *Route Planner* is a more advanced version of *Snail* *Bar Code Route Planner* reads route instructions from special cards, *Explore For Object* searches for obstacles and determines their shape *Explore For Walls* maps boundaries, *Sunseeker* finds a light source *Man Versus Buggy* allows 'blind' navigation using only information fed back from the Buggy *Line Follower* traces a black or white line, and *Tin Pan Alley* reads bar-codes as musical tones

The Buggy has been developed by MEP and Economatics in conjunction with the BBC It makes an appearance in Programme 8 of the new BBC tv computer series, *Making the Most of Your Micro*

Next year the BBC plans a whole series devoted to control applications in which the Buggy will be used Accompanying the Control tv series will be an NEC Control Technology Teaching Course and an NEC Teaching Board This hardware board will connect to the Buggy's interface card

Manufactured by Economatics the Buggy will be available in March The kit plus leads interface, software and instruction booklet is expected to cost around £120 plus VAT A power supply will be provided as an extra, but the Buggy will operate from the disc drive power supply on the BBC micro

Acorn display range of second processors

ACORN Computers demonstrated some of the exciting new peripherals for the BBC micro at a special BBC Computer Exhibition held at the World Trade Centre, London, from January 5 to 7

The show gave the BBC and Acorn a world first — a public demonstration of telesoftware Using a BBC micro fitted with Acorn Teletext Adaptor, broadcast software was downloaded to the computer from special pages held on Ceefax (Pages 700 705) The Teletext Adaptor is planned for sale in March

Also on display was Acorn's impressive range of second processors for the BBC Model B microcomputer There is now a choice of three units — a 6502-based unit with 64K Ram a Z80-based unit with 64K Ram and a 16032-based unit with 128K Ram

The Z80 processor gives the BBC machine an entry into the wide range of Z80 software — especially that operating under the CP/M system

The 16032 second processor is particularly interesting since this fast National Semiconductor chip has full 32-bit architecture and provides 16-bit output At present the unit incorporates 128K Ram but by using 128K DRams expansion to 1M Ram will be possible The National Semiconductor 16081 Floating point Unit will be compatible with the 16032 second processor

All three second processor units connect to the BBC micro through a special high speed data transfer interface chip — the 'Tube' The three processor units will be available as soon as final production of the Tube chips is completed — possibly in late March

The Z80 or 6502 second processor plus Tube interface Rom for the Tube operating system, connectors and 64K Ram will cost £195 plus VAT The price of the 16032 package has not been finalised but it is expected to be around £600 Acorn's Herman Hauser commented "At that price the unit is by far the least expensive' 32-bit processor in the world"

Orbis — a subsidiary of Acorn, also present at the show — demonstrated the prototype of a system to link the BBC micro to a video disc The computer, connected to a Pioneer Laser Disk System, controlled text prompts from the computer's monitor in tandem with the video picture from the laser disc system

Sinclair private share placement is on the cards

SINCLAIR Research has set in motion a plan to place a 10 percent share of the company with city institutions

The advantages of investment in the company were explained at a meeting last week between Clive Sinclair and selected institutions held at the offices of N M Rothschild, merchant bankers

The 10 percent share — part of Clive Sinclair's 95 per cent share — has been valued at as much as £20m, making the company as a whole worth £200m

Part of the capital raised by the sale will be used to continue funding development of an electric car This project is a separate development financed by Clive Sinclair and is not part of Sinclair Reasearch

Pre tax profits of Sinclair Research last year amounted to £10m on a £27m turnover Profits this year could reach £50m

Micro grants to train teachers

THE Department of Industry has announced a £1m scheme to give teacher training colleges micros

In order that best use can be made of the computers introduced into schools under the existing Department of Industry Micros in Primaries and Secondaries Schemes, the same range of equipment is now being offered to help teach the teachers

Under this latest grants plan more than 100 teacher training establishments will receive a Research Machines 480Z, Acorn BBC Model B or Sinclair Spectrum package

Colleges will also be invited to claim further funds of up to £15,000 per college with which to purchase software and peripheral devices

Swansea show

SWANSEA Computer Show will be held at the Swansea Leisure Centre, Oystermouth Road, from January 13 to 15 Entry is free and the show is open from 12 am to 9 pm on Thursday 9 am to 9 pm on Friday and 9 am to 4 pm on Saturday

Taking on board the Inca Curse

SINCLAIR Research continues its policy of taking the best of the independently produced software under its own wing

Latest additions to the Sinclair approved list include Melbourne House's Hobbit, and Artic's four adventures Planet of Death, Inca Curse, Ship of Doom and Espionage Island

The Hobbit is available for the Spectrum The Artic tapes have both Spectrum and ZX81 versions

Vic interface cartridge

DAMS Business Computers has produced a Vic I EEE interface cartridge for the Vic20 microcomputer

The cartridge plugs into the back of the Vic20 and enables disc drives, printers and other peripherals to be connected It also allows more than one computer to use the same disc drive

The Dams Vic I EEE interface is priced at £49 95 plus VAT, available from Dams Business Computers, Gores Road, Kirby Undustrial Estate, Liverpool

A version for the Commodore 64 machine is also planned.

LETTERS

Essential changes

Despite assurances in *Popular Computing Weekly* and other magazines that ZX81 programs containing no *Peek* or *Poke* statements can be entered directly into the Spectrum, I found that even then certain detailed changes and considerations are essential.

Firstly, while *Fast* and *Slow* can be ignored as far as input is concerned, one must look for *For/Next* loops used as delay timings when the ZX81 is operating in *Slow* mode. The Spectrum loop must be made about four times longer to give the same delay.

Secondly, lines using *Code* or *Chr$* must be converted to take account of the significant differences in coding of the two machines. Spectrum 0-9 digit codes are 48-57 compared with 28-37 on the ZX81 and capital letters A-Z are 65 to 90 on the Spectrum but 38-63 on the ZX81.

There is no simple or logical relationship between the two sets of codes, so changes must be on a case by-case basis (see list). It should also be noted that variables may often define *Codes*, and these need changing as well.

Finally, *Scroll* needs to be induced in some cases.

The advice you gave in Peek and Poke in the December 16/23 issue was therefore both inadequate and incorrect. I hope Mr Ames has not sold his Spectrum as a result of the advice given.

ZX81	SPECTRUM
0	32
1	130
2	129
3	131
4	130
5	136
6	132
8-10	need *Usr* definition
11	34
12	96
13	36
14	58
15	63
16-17	40-41
18	62
19-20	60-61
21	43
22	45
23	42
24	47
25	59
26	44
27	46
28-37	48-57
38-63	65-90
64-66	165-167
112	11
113	10
114-115	8-9
116	N/A
117	7
118	(13?)
119	12
120-121	N/A
126-127	N/A
128	143
129	141
130	142
131	140
132	135
133-134	133-134
135	139
136-138	need *Usr* definition
139-191	N/A (inverse characters)
192	N/A
193-194	22-23
196-211	175-190
212-215	192-195
216	34
217-221	197-201
222-224	203-205
225-227	224-226
228-229	N/A
230	230
231	N/A
232-251	232-251
252	N/A
253-255	253-255

Unused ZX81 codes are not listed. The ZX81 uses some "hatched" graphics which are not available in Spectrum graphics but can be added to the user-definable graphics set and the code change will be defined by the *Usr* key employed.

N N S Walfer
20 South Park Gardens
Berkhamsted
Herts HP4 1HZ

Missing printed circuit connection

Like many others I have bought an Amber 2400 printer for my early model A BBC computer, only to find that the buffer was failing to give up its secrets into the printer on demand.

All thanks must go to Dave Rainer, the Sherlock Holmes of Amber Printers of Andover, who solved the problem by deducing that there appears to be no printed circuit connection on the number 19 hole of the 26 din socket.

If this can happen to the Amber printer, then one must suppose that it can happen with other printers also. I would like to thank those concerned at Amber for all their help and hope that this gives the green light to other early BBC micros with the same problem.

Victor Sprok
Flat 1
The Cedars
Windsor Street
Chertsey
Surrey

Deliberate error messages

Only one of the five "bugs" referred to by Colin McCormick in *Popular Computing Weekly* December 16 is really a bug. The Vic20 fails to generate a "*File not found*" after reading an end-of-tape marker, instead it produces a "*Device not present*" error. It does not cause any problems other than a bit of confusion.

However, the other "bugs" referred to are actually deliberate error messages. You cannot *Load*, *Save* or *Verify* to device 2 (RS232) because the inclusion of ASCII control characters could cause problems with most RS232 devices. Hence the "*Illegal device number*".

Opening more than 10 files produces a "*Too many files*" error due to the limited space available for storing the file parameters. In practice this is not a worry since having more than two or three files open simultaneously is a rare occurrence.

Using device 0 is similar to using the keyboard, but it is treated as an external device. If you use *Input #* and try to read non-numeric characters into a numeric variable, the Vic will respond with "*File data error*" regardless of which device you use. This is the file equivalent of the "?*Redo from start*" error message.

If you *Load*, *Save* or *Verify* to any device other than cassette, a filename must be provided since this is often an intrinsic requirement of the external device (for instance, the disc drive). So, no filename will produce "*Missing filename*".

Mike Todd
Independent Commodore Products User Group
27 Nursery Gardens
Lodgefield
Welwyn Garden City
Hertfordshire AL7 1SF

A shorter and easier method

RE Screen$ on ZX81, *Popular Computing Weekly*, November 11, by Bill Henderson. A shorter, easier to use, method, is

```
PRINT AT Y,X;   move cursor to
   required X,Y co-ordinates on screen
C=PEEK(PEEK 16398+256*PEEK
   16399)   peek position of cursor
PRINT   cancel effect of above
   semi-colon
```

C now holds the code of the character at Screen$ (Y,X).

Kenneth Taylor
5 Hexham Close
Moorhouses Est
North Shields
Tyne and Wear
NE29 8BJ

Speeding up the Dragon

In Vol 1 No 35 there was a letter from Mr D Smith on changing the speed of the Dragon 32, with *Poke* 65495,0. This can be reset by using *Poke* 65494,0.

Both of these addresses access the SAM chip (see table below). Just two bits control the rate and these are normally 0, as shown here. The above *Pokes* set and clear the lower bit.

The upper bit can also be set by *Poke* 65497,0 either together with the lower bit, or by itself. This gives an even greater speed increase, but scrambles the usual output until this bit is cleared with *Poke* 65496.

I hope that this is of some use and that you continue to publish information on the Dragon.

Eric Cottam
36 Chyandor Close
Middleway
Par
Cornwall

ADDRESS				
DEC	HEX			
65497	FFD9	SET		
65496	FFD8	CLEAR	0	MPU
65495	FFD7	SET	0	RATE
65494	FFD6	CLEAR		

If you have an opinion you want to express, or have spotted an error that needs correcting, write to Letters, Popular Computing Weekly, Hobhouse Court, 19 Whitcomb Street, London WC2

Animated Engine

A new game for BBC model B by Ray Morris

This program draws an animated diagram of the workings of a four-stroke petrol engine. As the piston moves up and down in the cylinder, the crank rotates, the valves open and close and the spark plug fires.

The program is written as a series of procedures which plot the engine outline and move the piston and valves. The procedures are called in a repeat loop to illustrate the four strokes of the engine cycle.

Lines are plotted using a plot 5 command and rubbed out using a plot 7 command. The speed of the engine is changed by the value of *S*, the step size in the *For Next* loop which plots the piston movement. Labels are rubbed out by reprinting in the background colour.

The program is 2.2K long and runs on a BBC model B. It could be modified to run in mode 5 on a model A machine if the labels were repositioned to allow for the larger character size.

```
>L 00
L
10 REM ENGINE by Ray Morris
20 MODE 1
30 ONERROR GOTO80
40 VDU19 0 4 0 0 0
50 VDU19 3 0 0 0 0
60 GCOL0 128 GCOL0,2
70 VDU5
80 CLG
90 MOVE200 1000 PRINT "4 - STROKE PETROL ENGINE"
100 PROCBLOCK
110 PROCVALVE(415 790 5) PROCVALVE(585 790 5)
120 MOVE100 95 INPUT "SPEED - 5 TO 150 "S
130 REPEAT
140 GCOL0,2
150 PROCVALVE(415 700 7)
160 PROCVALVE(415 690 5)
170 GCOL0 3 MOVE150 770 PRINT "In >"
180 GCOL0 0 MOVE000 000 PRINT "EXHAUST" GCOL0,2 MOVE000 000
    PRINT "INTAKE" PROCDOWN
190 PROCVALVE(415 690 7)
200 PROCVALVE(415 700 5)
210 GCOL0 0 MOVE150 770 PRINT "In >"
220 GCOL0 0 MOVE000 000 PRINT "INTAKE" GCOL0,2 MOVE000 000
    PRINT "COMPRESSION"
230 PROCUP
240 GCOL0 1 PROCSPARK GCOL0,2
250 GCOL0 0 MOVE000 000 PRINT "COMPRESSION" GCOL0,2:
    MOVE000 000 PRINT "IGNITION"
260 PROCDOWN GCOL0 0 PROCSPARK GCOL0,2
270 PROCVALVE(585 700 7)
280 PROCVALVE(585 690,5)
290 GCOL0 1 MOVE750 770 PRINT "Out >"
300 GCOL0 0 MOVE000 000 PRINT "IGNITION" GCOL0 2
    MOVE000 000 PRINT "EXHAUST"
310 PROCUP
320 PROCVALVE(585 690 7)
330 PROCVALVE(585 700 5)
340 GCOL0,0 MOVE700 770 PRINT "Out >"
350 UNTIL 0
360 REM****************************
370 DEF PROCBLOCK
380 FORI = 1TO34
390 READM X Y PLOTM X Y
400 NEXT
410 DATA4 250 700 5 375 700 5,375 450
420 DATA5,250 300 5 300 110 5,300 100
430 DATA5 740 100 5 750 110 5 750 300
440 DATA5 625 450 5 625 700 5 750 700
450 DATA4,250 900 5 375 600 5 435 700
460 DATA5 445 790 5 455 700 5 545 700
470 DATA5 555 790 5 585 700 5 625 600
480 DATA5 750 600 4 490 700 5 460 710
490 DATA5 510 710 5 510 700 4 485 700
500 DATA5 495 695,5 505 695 5 505 700
510 DATA4 495 710 5 500 700 5 502 750
520 DATA5 585 710
530 ENDPROC
540 REM****************************
550 DEF PROCUP
560 A = 270 B = 300 500 * S
570 FOR X = 0 TO 150 STEP S
580 PLOT4 377 450 + X PLOT5 623 500 + X
590 PLOT4 377 520 + X PLOT5 623 620 + X
600 PLOT4 500 250
610 PLOT5 COS(RAD(A)) * 150 + 500 SIN(RAD(A)) * 150 + 250
620 PLOT5 500 450 + X
630 PLOT4 500,250
640 PLOT7 COS(RAD(A)) * 100 + 500 SIN(RAD(A)) * 100 + 330
650 PLOT7 300 450 + X
660 PLOT4 377 450 + X PLOT7 623 450 + X
670 PLOT4 377 500 + X PLOT7 623 520 + X
680 A = A + B NEXT
690 ENDPROC
700 REM****************************
710 DEF PROCDOWN
720 A = 90 B = 300 500 * S
730 FOR X = 150 TO 0 STEP - S
740 PLOT4 377 450 + X PLOT5 623 450 + X
750 PLOT4 377 520 + X PLOT5 623 620 + X
760 PLOT4 500 250
770 PLOT5 COS(RAD(A)) * 100 + 500 SIN(RAD(A)) * 100 + 000
780 PLOT5 500 400 + X
790 PLOT4 500 200
800 PLOT7 COS(RAD(A)) * 150 + 500 SIN(RAD(A)) * 150 + 250
810 PLOT7 500 400 + X PLOT7 500 200
820 PLOT4,377 450 + X PLOT7 623 450 + X
830 PLOT4 377 520 + X PLOT7 623 520 + X
840 A = A + B NEXT
850 ENDPROC
860 REM****************************
870 DEF PROCVALVE(V W D)
880 PLOT4 V  00 W PLOTD V + 30 W
890 PLOT4 V W PLOTD V W + 150
900 REM****************************
910 ENDPROC
920 DEF PROCSPARK
930 MOVE505 600 PRINT "*"
940 ENDPROC
```

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Christmas brings brisk business to the micro scene

Micros are in town

***David Kelly** scours the shops in search of micros with surprising results*

Looking back over 1982 one of the significant changes — as far as microcomputers were concerned — was the way that the machines became available in local high-street shops

Manufacturers now reckon that distribution through some high-street outlet is essential Machines must be available through stores such as Dixons Boots, Laskys and W H Smith

The past few months have seen the example set by Commodore's Vic20 machine copied many times The Vic20 was the first microcomputer to be prominently displayed in the windows of chain stores up and down the country The Sinclair ZX81 followed in branches of W H Smith Now both of these machines can be bought in almost any shopping street anywhere in the country

Recently the Atari 400/800 has popped up all over the place The Camputers Lynx is now to be found in Dixons Laskys and Spectrum stores The NewBrain is in Laskys as is the Jupiter Ace And only a few weeks ago the Sinclair Spectrum made its retail debut in selected branches of W H Smith

The Dragon 32 has been very successful, with retail outlets including Boots Dixons, Laskys and Debenhams The Commodore 64 has also found a home in Dixons and Laskys

But for all this emphasis on retail outlets a number of *Popular Computing Weekly* readers still complain that they are unable to buy the micros of their choice over the counter So, we conducted out own survey of high-street stores in London to find out which micros were actually in stock before Christmas

The results were not altogether surprising Many stores had either sold out of or not received their range of home micros This was largely due to the Christmas boom in demand for micros which caught many manufacturers unawares

The only micros available in anything like reasonable quantities at a variety of outlets were the Atari 400 and 800 machines The only reason they remained unsold appears to be their price — at £199 and £340 they seem expensive — and their image The sales assistant in John Lewis's in Oxford Street explained to one customer "If you want a games machine then I would recommend the Atari But if you want a computer then the Vic20 is a computer that plays games at a much cheaper price"

The Dragon 32 was nowhere in evidence For some weeks prior to Christmas the Dragon 32 machine had been in short supply — by the week before Christmas it was more or less unobtainable

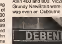
This unfortunate state of affairs was entirely due to the comparatively small manufacturing capacity of the Dragon Data operation The company can only produce somewhere in the region of 3 000 machines per week and will only be able to expand when it moves to new premises early in the new year This production shortfall must surely have lost Dragon many sales in the pre-Christmas period

As the first micro into the high-street, the Vic20 should have been in plentiful supply But very few shops had supplies of Vic20s for sale near Christmas Ian Williams, Dixon's Microbuyer said "It has been totally amazing As fast as we can get the Vic20s they are being sold

The manager of the microcomputer section in Debenhams had almost sold out of any sort of machine "I had 22 Vics left at the start of the morning and five have gone already I don't expect they will last the day,' he said "It has been very hectic I have one Atari 800 and 12 ZX81s remaining and that's the lot '

Debenhams were selling the Vic20 for £129 95 and one specialist shop in Regent Street was offering it for £125 But most of the other shops — including John Lewis and Dixons in Oxford Street and one of the branches of Laskys in Tottenham Court Road — had no Vic20s for sale The main Laskys branch, with a special micro computer section had a few Vic20s but could not supply the cassette player unit for the machine (Unlike some other machines the Vic20 requires a dedicated cassette unit)

The greatest selection of micros was to be found in the big Laskys store Over the last year the company has expanded its range of micros considerably Here, the Atari 400 and 800 Vic20 Jupiter Ace and Grundy NewBrain were all on show There was even an Osbourne 1



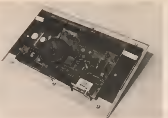
In none of the shops visited was there any sign of the Camputers Lynx the Commodore 64 or the Oric 1 But Laskys were taking orders for the Lynx, to be delivered in January, and offered to reserve a Commodore 64 for a deposit of £33

Ironically, considering its past record, the only machine available in any real quantities apart from the ZX81 was the Sinclair Spectrum This machine went on sale in some 70 top W H Smith stores at the beginning of December

At Smith's in Oxford Street a special section of the shop — called Electronics World — is devoted entirely to microcomputing A sales assistant had only one word to describe how things were going — 'Tremendous'

'We have about 300 16K and 48K Spectrums in stock at the moment" he said "When we started this morning the shelves were full We have had to fill them up three times already so far today

"We seem to sell more of the 48K machine mainly I think because people are worried that it will be difficult to get their 16K machines up-graded On the other hand the ZX81 sales are much slower — they still go but we haven't sold very many since we began to stock the Spectrum"



Inside the Oric showing the pcb loudspeaker modulator and cpu

Oric 1 — not just a Tangerine dream

***Tony Bridge** presents an exclusive review of the Oric 1, the first colour micro to cost less than £100*

Onto the battlefield of the home/hobby computer comes the latest contender for your money the Oric 1. Oric financed by British Car Auctions commissioned Tangerine long well-thought of for the MicroTan computer to design their first machine.

A large box contains the computer, manual, power supply and introductory tape. Unfortunately there is no cassette-to-computer lead so be warned — you will need a lead with a 5 or 3 pin Din plug on one end and either a Din plug or 3.5mm jack plug at the other end, depending on what sockets your cassette machine provides.

The keyboard is the most distinctive feature of the package consisting of 57 unusually shaped keys. While they certainly make for an eye-catching keyboard touch-typists will need a little time to get used to them. However, the keys feel like real keys with positive feedback, unlike some of the rubbery keypads on other microcomputers.

Both upper and lower case are available and all keys have auto-repeat. There is a standard *Qwerty* layout with *Esc Ctrl Del* and *Return* keys cursor control keys and a large space bar.

An audible *Beep* lower pitched in the case of the *Return* key is a reminder of correct contact. This can become rather annoying (to other members of the family if not yourself), but is easily switched off by pressing *Ctrl* and the *F* key.

At the back of the case are all the connections for tv, cassette machine and power together with an expansion port for future Ram updates and the Centronics interface (unusual, even unique, for a machine of this price) for a printer, joysticks and the Communications Modem when it becomes available. There is also a *Reset* button hidden away beneath the computer so that you may get out of an endless loop without switching off and thus losing the whole program.

Based on the 6502A microprocessor the Oric is 52mm high 280mm wide 175mm deep and weighs 1.1kg. It has 16K Rom which contains the Basic interpreter and operating system. Two versions of the Oric are available — a 16K Ram machine which costs £99.95 (including VAT) and a 48K machine which costs £169.95 (including VAT).

The 48K model actually possesses 64K Ram but 16K is overwritten by the Rom. However, external control lines can enable you to use the full 64K of Ram. Alternatively, the control lines can be used to expand the Rom externally.

The cassette interface operates at either 300 baud or 2400 baud. A Schmitt trigger circuit cuts down extraneous noise.

The machine supplied for review had a problem with the modulator which caused the tv to lock onto the wrong signal. This prevented the micro from working properly with the Sony Trinitron, Sony 12in portable NEC and Hitachi tvs though it was linked successfully to a Ferguson TX tv.

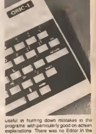
However, Oric claims to have overcome this problem by changing three of the resistors in the modulator. Nevertheless, it would be a sensible precaution to check that the Oric works on your tv before buying.

The Basic is an extended form of Microsoft and really holds no surprises. It supports full string handling with *LEFT$ RIGHT$* and *MID$* commands. *Data, Read* and *Restore* are also included in Oric's form of Microsoft and all the usual *Gotos*, *Gosubs* and loops may be implemented. A revised form of the Rom will also apparently include *If – Then – Else*.

The manual takes you through the elementary stages of using Oric Basic telling you what *Print* means how to use *For – Next* loops and so on. Information is slightly difficult to find in the manual as there is no index or chapter-by-chapter breakdown of the various commands. However, this edition of the manual is only temporary, as Oric themselves admit and will be replaced by a more comprehensive write-up. The final edition should be worth waiting for — how many manuals after all contain old Chinese proverbs as this one does?

I found typing in listings to be straightforward, although rather tedious after a Sinclair — no one touch keywords here, and also, unfortunately, no syntax-checking on entry. Thus the program has to be Run before a typing error is found. On *Listing* full indentation of lines is carried out making a neat job of your haphazard spacing.

Error codes though were extremely



useful in hunting down mistakes in the programs with particularly good on screen explanations. There was no Editor in the review model but this should be a standard feature in the production machine.

There are two modes available to you when programming. *Text*, as its name suggests is the one you will use to write text to the screen, either directly or from

within a program, and is the mode automatically selected by the Oric on power-up. *Hires* is the mode in which the computer draws high-resolution pictures, again under direct command or from within a program. Three lines at the bottom of the screen contain your Basic commands, so that you can see the results of your instructions.

Colours may, of course, be used in either mode. There are eight colours, including black and white, and they may be assigned via *Ink* and *Paper* commands to foreground or background respectively. Incidentally, do not be fooled by Oric's claims for 16 colours — they are counting both back- and fore ground colours.

In the *Hires* mode, the display consists of 240 × 200 pixels (in *Text* mode, the display contains 28 rows of 40 characters each). Several commands are available for drawing. *Curset* sets the cursor to a desired point on the screen — the command must be followed by three parameters, *X*, *Y* and *FB*, where *FB* is the



foreground/background colour. *Curmov*, similarly followed by the three parameters, sets the cursor to a point relative to the last plotted position. *Draw*, with the three codes again, will draw a straight line from the current cursor position plus *X* and *Y*.

Finally, also for line drawing, *Pattern* — a rather unusual command (unique, I think) that will impose a binary 'mask' on to the straight line. This works by taking the binary code of a number and breaking up the solid line into a series of dots, dashes and so on, as each pixel is switched on or off. So at power-up, the number 255, binary code 11111111, is loaded into the pattern mask, thus giving a solid line. The number 1, after the *Pattern* command, would give the code 00000001, or a dot every eighth pixel. The number 15, code 00001111, would give equal-sized dashes along the length of the line.

The *Circle* command is fairly self-explanatory. The cursor is first set, then a circle of the given radius, and colour, is drawn, with the cursor at centre. *Point* is a very useful command, which returns the colour of a particular pixel and checks to see if it is in the background or foreground colour. You will need this to check the position of your Space Invaders! The final command to be used with the graphics is *Fill*, which fills a given area with a colour or pattern.

You may define up to 96 of your own



Tony Bridge reviews the Oric 1

characters on the Oric, so Space Invaders with Greek and Russian instructions now becomes possible!

The sound commands on the Oric 1 are, for a computer of this price, very sophisticated. Three music channels, and one noise channel, mean that you can program some fairly complex sounds. Six octaves are available, and any or all of the three music channels are capable of being mixed with the noise channel and each other. There are also seven envelope shapes. All this may sound quite complicated, but in practice is fairly straightforward.

Games players may use the noise channel, together with the seven envelope modes, to produce their own annihilation sounds. But the Oric 1 kindly provides four predefined sounds to use within arcade games: *Zap*, *Ping*, *Shoot* and *Explode* — fairly self-explanatory, I think! The first two are successful, but the latter two sound a little tired, with a small hiccup at the end of the effect. However, they are very convenient to use, being called in a program merely by their name.

Summary

Who is the Oric 1 being aimed at? The ardent games player, the most likely purchaser at this end of the market, will no doubt be pleased with the graphic and sound capabilities of this microcomputer. These are surely a match for machines costing much more.

Oric Products themselves devote a lot of space in their advertisements to highlighting the advantages of the machine for the business user. They emphasise the availability of their modem, and promise (no date mentioned, however) microdrive discs and a speed printer.

The modem is certainly unusual in a machine of this price. Together with the other peripherals, when finally available, it should make for an attractive package for a small business. Anything larger than a very small business, however, would surely be looking at larger and more flexible systems than this.

The common factor for acceptance of any machine by both games-players and businessmen must be software. Any new machine will stand or fall with its supporting programs, however good his initial specifications.

Tangerine is working on an extended version of Basic, to be released soon. Also on the stocks are *Zodiac*, an adventure game, and a data management package. A multi-games cassette, containing standard programs such as *Lunar Lander* and *Noughts and Crosses*, is also due for release.

With independent software producers such as Bug-Byte also planning to write programs for the Oric, it seems certain to capture a slice of the market. ■

Rear view of the Oric showing, from left to right, TV socket, RGB socket, cassette socket, Centronics printer interface, expansion port and power (9VDC) socket

Open Forum is for you to publish your programs and ideas. Take care that the listings you send in are all bug-free. Your documentation should start with a general description of the program and what it does and then give some detail of how the program is constructed. We will pay the *Program of the Week* double our new fee of £5 for each program published.

Graphics

on Spectrum

Uncle Clive has provided us with a very useful circle drawing command on his Spectrum, but there is no provision for triangles squares, pentagons and so on. Why? Because it is incredibly simple to draw these shapes perfectly using only a three-line subroutine

Look at the routine in the listing. You can see three variables need to be set up before calling this subroutine. These are

1 SIDES — This is as it suggests, the number of sides that the shape has, e.g. LET SIDES = 5 would give you a pentagon on calling the subroutine

2 LENGTH — Again, this explains itself. It is the length (in single pixels) of each side of the shape e.g., LET LENGTH = 20 gives sides of length 20

3 ANGLE — This is the angle between the first side of the shape and the horizontal (in Radians), e.g. LET ANGLE = PI/6, gives a tilt of 30 degrees

Once these three variables are set, GOSUB 1000 draws the shape at the cursor position

There are three demonstration programs for you to try. First, 'Honycomb' fills the screen with hexagons, showing how they link with each other in a honeycomb pattern. Program two takes a pentagon and by twisting and shrinking it within itself, gives it a slightly three dimensional appearance.

Finally, the best program shows how clusters of polygons can generate other polygons, it cycles through 12 frames of patterns, some of which are spectacular, and all of them interesting. The entire pattern is stored as four or five numbers, try changing the data statements to produce your own displays. If you choose your colour correctly, this can be one of the most artistic programs you will ever see on any micro

Graphics subroutine

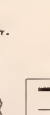
```
999 REM   GRAPHICS SUBROUTINE
1000 FOR a=0 TO 2*PI-.1 STEP 2*P
I/sides
1001  REM draws a straight line
              (sides) times
1010  DRAW length*COS (angle+a),
length*SIN (angle+a)
1011   REM  calculates angle to
             draw line,and draws
             it.
1020 NEXT a
1030 RETURN
```

Program 2

```
   5 BORDER 0: PAPER 0  INK 5  C
LS   LET sides=5
  10 FOR h=0 TO 100 STEP 10
  20 PLOT h/2+80,h*COS PI/5  LET
 length=110-h  LET angle=h/200
  30 GO SUB 1000
  40 NEXT h
  50 STOP
 999 REM   GRAPHICS SUBROUTINE
1000 FOR a=0 TO 2*PI-.1 STEP 2*P
I/sides
1010  DRAW length*COS (angle+a),
length*SIN (angle+a)
1020 NEXT a
1030 RETURN
```

Program 3

```
   5 BORDER 0  PAPER 0  CLS
  10 FOR n=1 TO 6  LET angle=0:
READ ink,sides,step,length
  20 INK ink  CLS
  30 PLOT 128,87  GO SUB 1000
  40 LET angle=angle+step
  50 IF angle<2*PI THEN GO TO 30
  60 PAUSE 150  NEXT n
  90 RESTORE 3000
 100 FOR n=1 TO 6  LET angle=0:
READ ink,sides,step,length,centr
e
 120 INK ink  CLS
 130 PLOT 128+centre*COS angle,8
7+centre*SIN angle  GO SUB 1000
 140 LET angle=angle+step
 150 IF angle<2*PI THEN GO TO 13
0
 160 PAUSE 150  NEXT n
 170 RUN
 999 REM   GRAPHICS SUBROUTINE
1000 FOR a=0 TO 2*PI-.1 STEP 2*P
I/sides
1010  DRAW length*COS (angle+a),l
ength*SIN (angle+a)
1020 NEXT a
1030 RETURN
1995 REM        DATA FOR SHAPES,
1999 REM     COLOURS AND SIZES.
2000 DATA 7,8 2*PI 6,50
2010 DATA 3,6,PI/3 40
2020 DATA 4 5 PI/5 45
2030 DATA 6 5 PI/5 55
2040 DATA 5,7 PI/7,45
2050 DATA 3,4 PI/8 50
2995 REM        SAME DATA BUT
2999 REM    CENTRE MOVES ABOUT.
3000 DATA 7 8 2*PI/8 50,-50
3010 DATA 5 6 PI/3,40 -20
3020 DATA 4 5 PI/5,40,-20
3030 DATA 6 5 PI/5,55 -30
3040 DATA 5,7 PI/7,40 -30
3050 DATA 3,4,PI/8,70 -30
```





Honeycomb

```
   5 REM        HONEYCOMB
  10 BORDER 0  PAPER 0  INK 5  C
LS   LET sides=6  LET length=10
  20 FOR h=10 TO 230 STEP 30
  30 FOR v=10 TO 150 STEP 18
  40 PLOT h,v  GO SUB 1000
  50 PLOT h+15,v+9  GO SUB 1000
  60 NEXT v  NEXT h
  70 STOP
 999 REM   GRAPHICS SUBROUTINE
1000 FOR a=0 TO 2*PI-.1 STEP 2*P
I/sides
1010  DRAW length*COS (angle+a),
length*SIN (angle+a)
1020 NEXT a
1030 RETURN
```

Graphics
by Bill Longley

Utility draw

on Spectrum

This program is very easy to use. Listed below are the commands available

o — input the over

d — draw for inputted x and y and draw x and draw y

c — circle for inputted x and y co-ordinates of the centre and the radius

s — save the design on the screen on tape as a screen $

r — reset the flashing pixel cursor to wherever you want it on the screen

You move the pixel cursor as below

T	Y	U
G	•	J
B	N	M

Once you have entered the program, to save it on tape, type RUN 550

To obtain a design like my map of Europe, you need a bit of patience. First draw the design on the TV screen with a water washable pen, and then use the program to copy the design

Program notes:

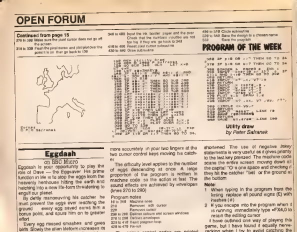
164 to 115 Titles
126 Initialises the program
1a to 200 Check if any keys are pressed. If they are, check if any of the command keys are pressed. If they are then do the command required

Turn to page 16

Continued from page 15

270 to 300 Make sure the pixel cursor does not go off the screen
310 to 330 Flash the pixel cursor and plot/plot over the point it is on then go back to 130
340 to 400 Input the ink border paper and the over Check that the numbers input are not too big If they are go back to 340
410 to 420 Reset pixel cursor subroutine
430 to 480 Draw subroutine
490 to 510 Circle subroutine
520 to 540 Save the design to a chosen name
550 Save the program

PROGRAM OF THE WEEK




```
100 REM Utility draw
110 REM © 1982 P Safranek
120 GO SUB 340: CLS : LET x=0: L
ET y=0
130 LET a$=INKEY$
140 IF a$<>"0" AND a$<>"4" AND
a$<>"5" AND a$<>"r" AND a$<>"c"
THEN GO TO 210
150 IF a$="0" THEN GO SUB 390
160 IF a$="d" THEN GO SUB 430
170 IF a$="e" THEN GO SUB 520
180 IF a$="r" THEN GO SUB 410
200 IF a$="c" THEN GO SUB 490
210 LET x=x+(a$="[illegible]")-(a$="[illegible]")
220 LET y=y+(a$="[illegible]")-(a$="[illegible]")
230 LET x=x+(a$="[illegible]")-(a$="[illegible]")
240 LET y=y+(a$="[illegible]")-(a$="[illegible]")
250 LET x=x+(a$="[illegible]")-(a$="[illegible]")
260 LET y=y+(a$="[illegible]")-(a$="[illegible]")
270 IF x<0 THEN LET x=0
280 IF x>255 THEN LET x=255
290 IF y>175 THEN LET y=175
300 IF y<0 THEN LET y=0
310 PLOT x,y: PLOT OVER 1;x,y
320 PLOT x,y: PLOT OVER 0;x,y
330 GO TO 130
340 INPUT "Ink (0-7)? ";i;"Pap
er (0-7)? ";p;"border(0-7)? ";b
350 IF i<0 OR i>7 THEN GO TO 34
0
360 IF p<0 OR p>7 THEN GO TO 34
0
370 IF b<0 OR b>7 THEN GO TO 34
0
380 BORDER b: PAPER p: INK i
390 INPUT "over(0 or 1)? ";o: IF
o<>1 AND o<>0 THEN GO TO 390
400 RETURN
410 INPUT "x? ";x;"y? ";y
420 RETURN
430 INPUT "x coord";a
440 INPUT "y coord";b
450 INPUT "draw x?";c
460 INPUT "draw y?";d
470 PLOT a,b: DRAW c,d
480 RETURN
490 INPUT "x? ";xx;"y? ";yy;"r?";
r
500 CIRCLE xx,yy,r
510 RETURN
520 INPUT "Name? ";LINE f$
530 SAVE f$SCREEN$
540 RETURN
550 SAVE "ut.draw" LINE 100
```

Utility draw
by Peter Safranek

Eggdaah

on BBC Micro

Eggdash is your opportunity to play the role of Dave — the Eggsaver His prime function in life is to stop the eggs from the heavenly henhouse hitting the earth and hatching into a new life-form threatening to engulf our planet

By deftly manoeuvring his catcher he must prevent the eggs ever reaching the ground every egg saved earns him a bonus point, and spurs him on to greater effort

Every egg missed smashes and gives birth Slowly the alien lifeform increases its power and size until it reaches the catcher destroys it and poor Dave

His job prospects are in your hands or more accurately in your two fingers at the two cursor control keys moving his catcher

The difficulty level applies to the number of eggs descending at once A large proportion of the program is written in machine code so the action is fast The sound effects are achieved by envelopes (lines 270 to 290)

Program notes

10 to 200	Machine code
210	Removes edit cursor
220	Removes cursor
230 to 260	Defines colours and screen windows
270 to 290	Defines envelopes
320 to 410	Basic program loop
420 to 470	Re-run

The colour control codes are printed down the left-hand edge of the screen and are secured as the screen window is shortened The use of negative *Inkey* statements is very useful as it gives priority to the last key pressed The machine code scans the entire screen moving down all the capital "O"s one space and checking if they hit the catcher "bat" or the ground at the bottom

Note

1 When typing in the program from the listing replace all pound signs (£) with hashes (#)
2 If you escape into the program when it is running immediately type *FX4,0 to retain the editing cursor

I have outlined one way of playing this game, but I have found it equally nerve-racking when I try to avoid catching the eggs My highest score is 82 when I try to catch them, three when I try to miss!

```
VDU2
>L.
   10?&82=0
   20 INPUT"LEVEL 1=HARD 9=EASY"QW
   30IF QW<1ORQW>9THEN 20
   40 QW=QW/10
   50 ?&88=0
   60 X=HIMEM+960
   70 Y=(HIMEM-1)DIV 256
   80 DIM C 512
   90 FOR PASS=0TO2 STEP2
  100 P%=C
  110 [OPT PASS
  120 .start LDA £(X MOD 256):STA &80:
      LDA £(X DIV 256):STA &81
  130 .loop LDY £&00:LDA (&80),Y:CMP
      £79:BNE skip
  140 LDY£40:LDA(&80),Y:CMP £95:BEQ hash
  150 CMP £96:BNE go:LDA £32:LDY £&00:
      STA (&80),Y:STA &82:JMP skip
  160 .go LDA £79:STA (&80),Y:LDY £&00:
      LDA £32:STA (&80),Y:JMP skip
  170 .hash LDY £&00:STA (&80),Y:LDA
      £255:STA &88:LDA &80:STA &83:LDA
&81:STA &84
  180 .skip DEC &80:LDA &80:CMP £255:BNE
      loop:DEC &81:LDA &81:CMP £Y:BNE loop
  190 RTS
  200 ]:NEXT PASS:MODE7
  210*FX4,1
  220!&FE00=&10200A
  230 FORF=1TO15:VDU31,0,F,129:NEXTF
  240 VDU31,0,16,131
  250 FORF=17TO24:PRINTTAB(0,F)CHR$132:
      NEXTF
  260 VDU 28,1,24,39,0
  270 ENVELOPE1,1,0,0,0,0,0,0,-1,-1,-1,
      -1,126,-100
  280 ENVELOPE2,1,-1,-1,-1,80,80,80,126,
      -1,-1,-2,126,0
  290ENVELOPE3,1,1,0,0,20,1,1,126,0,0,
      -126,126,126
  300 X=10:PRINTTAB(1,24)"££££££££££££££
      ££££££££££££££££££££££"
  310 SC=0
  320 IF RND(1)>QW THEN ?(HIMEM+41+RND
      (38))=79:SOUND&11,2,-50,5
  330?&82=0
  340 CALL start
  350 IF ?&82=32 THEN SOUND&13,3,100,5:
      ?&82=0:SC=SC+1:PRINTTAB(0,0)SC
  360 IF ?&88=255 ?&88=0:SOUND&10,1,4,5:
      C=?(&84)*256+?(&83):IFC>HIMEM+16*40
  AND C<HIMEM+17*40 THEN GOTO 420
```

Turn to page 21

Let Commodore expand your horizons.

VIC 20 is the finest home computer that money can buy.

And the better you get to know it, the more confident, adventurous and ambitious you'll become.

You'll want to take advantage of the vast range of VIC software: a superb and constantly-growing selection of programs, embracing business systems, entertainment, education and many applications in the home.

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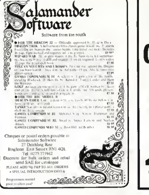
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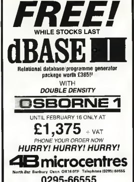


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Continued from page 16

```
370 X=X+INKEY(-26)-INKEY(-122)
3801F X<0THENX=0
390 1F X 30 THEN X=30
400 PRINTTAB(X,15)" _______ '
410 BOTO320
420 FORF=1TO5000:NEXTF
430 CLS:FORF=1TO2:VDU141:PRINT"YOU
    LOSE':NEXTF
440 PRINT'''"SCORE="SC
450 PRINT''CHR$136CHR$129"PRESS ANY
    KEY"
460 A=GET
470 CLS:RUN
```

Eggdash
by Nick Wilson

Bar graph

on Dragon

This Bar Graph program was written for those interested in analytical data both for semi-serious applications and let's have fun with figures Dragon users It will print on the screen in bar graph format a tabulation of figures (say income or expenditure) for a six month period and calculate the grahd total for that period at the same time computing the average The maximum scale is 20 but at a pinch 25 due to screen size limitations, therefore a 'unit factor' is used, but must be calculated manually

It should be a fairly simple matter to modify the program to input figures larger than 20 and let the Dragon compute the scale automatically

The colour bars for each month can be altered to suit one's taste by changing the CHR$ (143 + – – –) commands See your Dragon manual for colours available The variables used are *A* for the amounts *M$* for the months and *AT* for the average total also *GT* for grand total The *p* variable decides where on the screen the bars should appear If required the program can be extended to produce 12 monthly information by introducing six more inputs and print statements providing you can squeeze it all on to the screen

```
5 REM DRAGON BAR GRAPH BY E. N. MACKRELL
10 CLS 3
20 PRINT"DRAGON CALC BAR GRAPH-INPUT YEAR &
   SIX MONTHLY FIGURES"
22 PRINT"MAX SCALE 0-20 USE UNIT FACTOR"
25 LINE INPUT "COMMODITY:";Q$
30 LINE INPUT"YEAR";Y$
40 LINE INPUT"UNIT";U$
50 INPUT 'MONTH";M1$
60 INPUT "AMOUNT";A1
70 INPUT "MONTH";M2$
80 INPUT"AMOUNT";A2
90 INPUT"MONTH";M3$
100 INPUT"AMOUNT";A3
110 INPUT "MONTH";M4$
120 INPUT "AMOUNT";A4
130 INPUT "MONTH";M5$
140 INPUT"AMOUNT";A5
150 INPUT "MONTH",M6$
160 INPUT"AMOUNT";A6
170 CLS
180 PRINT @ 0,Q$;
190 PRINT @ 51,"UNIT:"
200 PRINT @ 34,"YEAR ";
210 PRINT @ 40,Y$;
220 PRINT @56,U$
230 PRINT @64,M1$
240 PRINT @96,M2$
250 PRINT @128,M3$
260 PRINT@160,M4$
270 PRINT @192,M5$
280 PRINT @ 224,M6$
290 LETP1=67
300 LET P2=99
310 LET P3 =131
320 LET P4=163
330 LETP5 =195
340 LETP6=227
350 FOR Y=0 TO A1
360 IF A1=>1 THEN PRINT @ P1,CHR$(143+16)
370 P1=P1+1
380 NEXT Y
390 PRINT @ P1,A1
400 FOR N=0 TO A2
410 IF A2=>1 THEN PRINT @ P2,CHR$ (143+48)
420 P2=P2+1
430 NEXT N
440 PRINT @P2, A2
450 FOR J = 0 TO A3
460 IF A3=>1 THEN PRINT @P3,CHR$(143+32)
470 P3=P3+1
480 NEXT J
490 PRINT @ P3,A3
500 FOR X= 0 TO A4
510 IF A4=>1 THEN PRINT @P4,CHR$(143+112)
520 P4=P4+1
530 NEXT X
540 PRINT @ P4,A4
550 FOR T = 0 TO A5
560 IF A5=>1 THEN PRINT @P5,CHR$(143+64)
570 P5=P5+1
580 PRINT @ P5,A5
590 NEXT T
600 FOR K=0 TO A6
610 IF A6=>1 THEN PRINT @P6,CHR$ (128)
620 P6=P6+1
630 NEXT K
640 PRINT @P6,A6
650 PRINT @440,"";
660 LET AST=A1+A2+A3+A4+A5+A6
670 LET P7=323
680 LET AT=AST/6
690 FOR S=0 TO AT
700 IF AT=>1 THEN PRINT @ P7,CHR$(131)
710 P7=P7+1
720 NEXT S
```

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```
730 PRINT @P7,AT
740 PRINT @298,"AVERAGE:"
750 PRINT @448,"",
760 LET GT=A1+A2+A3+A4+A5+A6
770 PRINT @ 352,"GRAND TOTAL ALL MONTHS:";GT
780 PRINT@448,"";
790 LET P8=384
800 FOR W=1 TO 32
810 PRINT@P8,"-";
820 P8=P8+1
830 NEXT W
850 PRINT"DRAGON CALC-USE UNIT FACTOR"
900 PRINT @448,"";
```

Bar graph
by Ed MacKrell

Joysticks

on Vic 20

The following subroutine can be used at the beginning of any program requiring joy-sticks. It enables all the switches of the stick to be peeked at different memory locations. If a switch is on then a zero is returned at the corresponding location as follows

Location	*Switch*
7664	Right
7665	Down
7666	Left
7667	Up
7668	Fire

The subroutine is called by SYS 6656 which must be called before reading the joy-stick. It is protected in memory, but still allows room for user defined graphics. The upper case character set with defined characters can be loaded into locations 7168 to 7679 in the normal way.

If this facility is not required then lines 0 and 1 need to be changed as follows

```
0 POKE 56 28 POKE 52 28 POKE 51 0 POKE 56 0
1 FOR A = 7168 to 7218 READ B POKE A B NEXT
```

Machine Code Subroutine

```
0 POKE 56 26 POKE 52,26 POKE 51 0 POKE 56,0
1 FOR A = 6656 TO 6700 READ B POKE A,B
  NEXT
2 DATA 169 127,141,34 145,173,32,145,41
  128 141
3 DATA 248 29 169,255 141 34 145,173 31
  145 41 8
4 DATA 141,241 29 173 31 145 41 16 141
  242 29 173
5 DATA 31 145 41 4 141 243 29 173 31 145
  41 32 141
6 DATA 244,29 96
```

by Tim Vanes

Basic delete

on ZX81

The program is designed to run in a Sinclair ZX81 and its purpose is to delete part of a Basic program from a specified line number to the end, as in deleting a program used to input machine code or a basic utility when no longer required.

There are no absolute addresses, so the program of 34 bytes may be put anywhere convenient (above 'Ramtop' is usually as good as anywhere).

The program starts from address 16509, where the high byte of the first line number is examined and compared with the byte inputted. If different, the search progresses to the next line number, but if identical then the low byte is similarly examined; if different, the search moves to the next line number. Eventually, when the correct line number is found, and its address known, a 'N/L' character is poked into the address formerly occupied by the high byte of the line number, so that this point is marked as the end of the basic program, and a call is made to 1027 in Rom, which holds a routine for deletion.

ld hl,16509	33 125,64
ld b (hl)	70
ld a (hl)	126
cp	254
hl	xxx
High byte of first line number for deletion	
jrz DIS	40 8
inc hl	35
inc hl	35
ld c (hl)	78
inc hl	35
ld b (hl)	70
add hl bc	9
inc hl	35
jr DIS	24,241
inc hl	35
ld b (hl)	70
ld a (hl)	126
cp	254
N	yyy
Low byte of first line number for deletion	
jrz DIS	40 2
jr DIS	24 239
dec hl	43
ld(hl) N	54 118
inc hl	35
jpNN	195,3 4

The two bytes 'xxx' and 'yyy', corresponding to the number of the first line to be deleted, are *Poked* before running, or a couple of basic lines may be used to do this.

by Robin Mustoe

Zener test

on BBC Micro

This colourful program is based on the testing of people's ESP using Zener cards. The symbols on the cards are represented graphically using the BBC micro's Mode 2 graphics. You must guess the sequence in which the computer has dealt the cards. Instructions are included in the program.

Even if you don't believe in a sixth sense you can still use the program as a game or as an aid to teaching children due to the use of large colourful shapes.

The main subroutines are labelled with Rem statements. The computer's sequence is stored in the array A%(). The subroutine used to shuffle the cards is simple but ensures that no two cards are the same. Your guesses are stored in the array B%().

The star is drawn by plotting triangles first in blue then smaller triangles in black.

The circle is drawn using the formula of Y = SQR(R * R - (X * X)) and is produced using the same method as the star, drawing first in yellow then black. After each five guesses a portion of the screen is cleared. This is achieved by setting up a graphics window so that the top part of the screen is unaffected when a CLG is issued.

```
  5 REM** ZENER TEST*NHT-GLJ OCT82**
 10 MODE7 DIM A%(5),B%(5)
 20 PRINTTAB(12,0),CHR$141+CHR$133,"ZENER TEST"'TAB(12,1);CHR$141+CHR$133+"ZEN
ER TEST"''
 30 PRINT"THE OBJECT OF THIS PROGRAM IS TO TEST   YOUR POWERS OF CLAIRVOYANCE"
'' "USING YOUR EXTRA_SENSORY PERCEPTION YOU MUST CHOOSE A SEQUENCE OF SHAPES TO"
 "CORRESPOND WITH THE COMPUTERS."''''"YOU WILL GO THROUGH 5 SUCESSIVE TESTS."
```

Turn to page 24

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```
40PRINT"AT THE END,THE COMPUTER WILL DISPLAY"'"YOUR RESULT AS A PERCENTAGE."
50 PRINT'''''TAB(3);CHR$136+CHR$129+"PRESS SPACE BAR TO CONTINUE"
60 S=GET MODE2
70 REM***DRAW SHAPE+NUMBER****
80 YP%=920 VDU 5
90 FOR DT%=1TO5 XP%=(DT%-1)*256+120 ON DT% GOSUB 300,360,410,450,500
100 GCOL0,7:MOVEXP%-20,800 PRINT,DT%;:NEXT VDU4
110 GCOL0,6 MOVE 0,740 DRAW1280,740
120 VDU24,0,0 1279,730, ALLSUM=0 FOR MAINLOOP=1TO5
130 PRINTTAB(0 10),"TEST ",MAINLOOP'"INPUT 5 GUESSES";
140 REM*******RANDOM*SEQUENCE*******
150 A%(1)=RND(5) B%(1)=0 FOR L%=2TO5:B%(L%)=0
160 A%(L%)=RND(5):FOR V%=1TO L%-1:IF A%(L%)=A%(V%) V%=L% NEXT GOTO160
170 NEXT:NEXT
180 REM********CHOOSE*AND*DRAW*******
190 XP%=128 YP%=450 FOR GL%-1TO5
200 REPEAT N%=GET-48 UNTIL N%>0 AND N%<6
210 FOR GLJ%=1TO GL% IF B%(GLJ%)=N% VDU7,7,7 GLJ%=GL%:NEXT GOTO 200
220 NEXT:B%(GL%)=N% ON N% GOSUB 300,360,410,450,500 XP%-XP%+256 NEXT
230 REM***DRAW THE RANDOM SEQUENCE**
240 S%=0 XP%=128 YP%=200 FOR LG%=1TO5 N%=A%(LG%):IF A%(LG%)=B%(LG%) S%=S%+1
250 ON N% GOSUB 300,360,410,450,500 XP%=XP%+256 NEXT LG%
260 PRINTTAB(0,29);"SCORE=",S%''PRESS SPACE BAR"
270 *FX15.1
280 ALLSUM=ALLSUM+S%:G-GET:CLG NEXT MAINLOOP PRINT"AVERAGE-",ALLSUM*4;"%":
290 G=GET RUN
300 REM*************CIRCLE*************
310 SOUND1,-10,30,5:J%=FALSE:GCOL0,3 R%=100
320 SUB%=R%*R%+1 FOR L%=1TOR% STEP0 Y%=SQR(SUB%-(L%*L%))
330 MOVE(L%+XP%),(Y%+YP%) DRAW(L%+XP%),(YP%-Y%) MOVE(XP%-L%),(Y%+YP%)
340 DRAW(XP%-L%),(YP%-Y%) NEXT L% IF J%=TRUE KL%=TRUE RETURN
350 R%=80 J%-TRUE GCOL0.0 GOTO320
360 REM*************SQUARE*************
370 SOUND 1,-10,60,5 GCOL 0.5 TL%=0 WP%=100
380 XX%=XP%-WP% XY%=XP%+WP%
390 FOR LOOP%=YP%-WP% TO YP%+WP% STEP4 MOVE XX%,LOOP% DRAW XY%,LOOP%:NEXT
400 IF TL%=TRUE RETURN ELSE GCOL 0.0 WP%=78 TL%=TRUE GOTO 380
410 REM**************CROSS*************
420 SOUND 1,-10,90,5 GCOL 0,1 FOR LOOP%=-10 TO 10 STEP 2
430 MOVE XP%-100,YP%+LOOP%:DRAW XP%+100,YP%+LOOP% MOVE XP%-LOOP%,YP%+100
440 DRAW XP%-LOOP%,YP%-100 NEXT LOOP%:KL%-TRUE RETURN
450 REM*************TRIDENT*************
460 SOUND 1,-10,120,5 GCOL 0,2 FOR LOOP%=-10 TO 10 STEP 4
470 MOVE XP%+LOOP%,YP%+100:DRAW XP%+LOOP%,YP%-100 MOVE XP%+LOOP%,YP%+100
480 DRAW (XP%+LOOP%)-80,YP%-100 MOVE XP%+LOOP%,YP%+100
490 DRAW (XP%+LOOP%)+80,YP%-100 NEXT LOOP% KL%=TRUE RETURN
500 REM**************STAR**************
510 SOUND 1,-10,150,5:GCOL 0,4
520 MOVE XP%-100,YP%-50 MOVE XP%+100,YP%-50 PLOT 85,XP%,YP%+100
530 MOVE XP%-100,YP%+50 MOVE XP%+100,YP%+50 PLOT 85,XP%,YP%-100
540 MOVE XP%-60,YP%-30 MOVE XP%+60,YP%-30 PLOT 87,XP%,YP%+70
550 MOVE XP%-60,YP%+30 MOVE XP%+60,YP%+30 PLOT 87,XP%,YP%-70
560 KL%=TRUE RETURN
```

Zener test
by G Jones

Animals

on ZX81

This program was written by my two daughters to run on a ZX81. The idea is so simple that it could easily be converted to run on any computer. In devising the program it helped their education considerably by trying to distinguish one animal from another (if anyone can write the difference between a duck and goose so that a child of eight could understand I would be interested to see it). At the moment they are extending the program to include all the animals in the UK.

The program can be made to re-run itself by changing each line that has STOP in it to

```
     THEN GOTO 1300
1300 PRINT "DO YOU WANT TO TRY AGAIN?
1310 INPUT G$
1320 IF G$ = "Y" THEN GOTO 22
1330 PRINT "OK I'LL SAY GOODBYE"
1340 FOR A = 1 to 50
1350 NEXT A
1360 NEW
```

```
2 REM "ANIMALS"
4 REM " COPYRIGHT C AND E SAYERS 1982"
5 PRINT " I WANT TO PLAY A GAME WITH YOU; AT 5,3;
  " THINK OF A DOMESTIC OR FARM ANIMAL"
10 PAUSE 300
12 CLS
15 PRINT NOW I WILL ASK YOU SOME QUESTIONS", AT 5,0; " JUST
   ANSWER YES WITH THE Y KEY AND NO WITH THE N KEY"
20 PAUSE 300
22 CLS
25 PRINT " ARE YOU READY HERE DOMES THE 1ST QUESTION'
26 PAUSE 100
28 CLS
30 PRINT " HAS IT GOT 2 LEGS?"
40 INPUT A$
45 CLS
50 IF A$ = "N" THEN GOTO 200
52 PRINT ' HAS IT GOT FEATHERS?"
54 INPUT Z$
55 CLS
56 IF Z$ = "N" THEN GOTO 1100
60 PRINT " CAN IT SWIM?"
70 INPUT B$
75 CLS
80 IF B$ = "N"THEN GOTO 130
90 PRINT " IS IT A MALE?"
100 INPUT C$
105 CLS
110 IF C$ = "Y" THEN PRINT AT 10, 0; " ITS A DRAKE
    OR A GANDER"
120 IF C$ = "N" THEN PRINT AT 10, 0; " ITS A DUCK
    OR A GOOSE"
125 STOP
130 PRINT " DOES IT GIVE US EGGS?"
140 INPUT D$
145 CLS
150 IF D$ = "Y" THEN PRINT AT 10,0; " ITS A HEN"
155 IF D$ = "Y" THEN STOP
160 PRINT " DOES IT SAY GOBBLE GOBBLE?"
170 INPUT E$
175 CLS
180 IF E$ = "Y" THEN PRINT AT 10,0, " ITS A TURKEY'
185 IF E$ = "Y" THEN STOP
190 IF E$ = "N" THEN GOTO 700
195 STOP
200 PRINT " DOES IT LIVE ON A FARM?"
210 INPUT F$
215 CLS
220 IF F$ = "Y" THEN GOTO 420
230 PRINT " DOES IT WASH ITS FACE?"
240 INPUT G$
250 IF G$ = "Y" THEN PRINT AT 10, 0; " ITS A CAT "
255 IF G$ = "Y" THEN STOP
260 PRINT ' DOES IT HAVE A TAIL?"
270 INPUT H$
275 CLS
280 IF H$ = "N" THEN PRINT AT 10, 0; " ITS A GUINEA
    PIG"
285 IF H$ = "N" THEN STOP
290 PRINT " IS IT BIGGER THAN A RAT?"
300 INPUT I$
305 CLS
310 IF I$ = "Y" THEN GOTO 380
320 PRINT " DOES IT LIVE IN A SEWER?"
324 INPUT T$
326 CLS
328 IF T$ = "Y" THEN PRINT AT 10,0; ' ITS A RAT ,
    "UGH HOW NASTY"
329 IF T$ = "Y" THEN STOP
330 PRINT" DOES IT HAVE BIG EYES?"
340 INPUT J$
350 CLS
360 IF J$ = "Y' THEN PRINT AT 10,0," I THINK ITS A
    GERBIL'
365 IF J$ = "Y" THEN STOP
370 PRINT AT 10,0," IS IT A LITTLE MOUSE?'
375 GOTO 600
380 PRINT " DOES IT WAG ITS TAIL?"
390 INPUT K$
395 CLS
400 IF K$ = "Y" THEN PRINT AT 10,0; " ITS A DOG"
410 IF K$ = "N" THEN PRINT AT 10,0;" IS IT
    A RABBIT?"
415 GOTO 600
420 PRINT ' HAS IT GOT HORNS?'
430 INPUT L$
435 CLS
440 IF L$ = "Y" THEN GOTO 900
450 PRINT " DOES IT GIVE US WOOL?"
460 INPUT M$
470 CLS
480 IF M$ = "Y" THEN PRINT AT 10,0;' ITS A SHEEP"
490 IF M$ = "N" THEN GOTO 900
495 STOP
500 PRINT "IS IT A FEMALE?"
510 INPUT P$
515 CLS
520 IF P$ = "Y" THEN PRINT AT 10,0;" ITS A COW"
525 IF P$ = "Y" THEN STOP
530 PRINT " DOES IT GIVE US WOOL
540 INPUT S$
545 CLS
550 IF S$ = "Y' THEN PRINT AT 10,0;" ITS A RAM"
560 IF S$ = "N' THEN PRINT " IS IT A BULL?"
600 INPUT U$
610 CLS
620 IF U$ = "Y" THEN PRINT AT 10,0," I THOUGHT

625 PRINT " IS IT A FISH, A TORTOISE OR A
    [ 2 spaces] FROG?"
630 INPUT U$
632 CLS
635 IF U$ = "Y" THEN PRINT' NONE OF THESE ARE
    ANIMALS SILLY"
645 IF U$ = "N" THEN PRINT " YOU HAVE BEATEN ME"," I
    DONT KNOW WHAT IT IS"
650 STOP
700 PRINT ' DOES IT LIVE IN A CAGE IN A HOUSE?"
710 INPUT V$
715 CLS
720 IF V$ = "N" THEN PRINT AT 10,0, " ITS A
    COCKEREL'
725 IF V$ = "N' THEN STOP
730 PRINT " ARE SOME OF THESE GREEN?'
760 INPUT W$
770 CLS
780 IF W$ = "N" THEN PRINT AT 10,0; " ITS A CANARY'
790 IF W$ = "N" THEN STOP
800 PRINT " DO THEY SOMETIMES HAVE "," RED
    FEATHERS?"
810 INPUT X$
815 CLS
820 IF X$ = "Y" THENPRINT AT 10,0," ITS A PARROT"
830 IF X$ = "N" THEN PRINT AT 10,0," I THINK ITS A
    BUDGIE"
840 STOP
900 PRINT " DOES IT HAVE HOOVES?"
910 INPUT Y$
920 CLS
930 IF Y$ = "N" THENPRINT AT 10,0, " ITS A
    SHEEPDOG'
940 IF Y$ = "N' THEN STOP
950 PRINT " DOES IT HAVE HORNS?"
960 INPUT Z$
965 CLS
970 IF Z$ = "Y" THEN PRINT AT 10,0, " I THINK ITS A
    GOAT"
980 PRINT DOES IT HAVE A CURLY TAIL?"
990 INPUT A$
1000 CLS
1010 IF A$ = "Y" THEN PRINT AT 10,0; " ITS A BIG FAT
     PIG'
1020 IF A$ = "N" THEN PRINT AT 10,0; " I THINK ITS A
     HORSE'
1030 STOP
1100 PRINT AT 10,0, " IT MUST BE THE FARMER"," OR
     HIS WIFE"
```

Animals
by Derek Sayers



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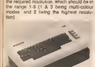
Mastering the art

***R Morgan** presents a drawing routine for the Vic20 with Super-Expander.*

This hi res drawing program runs on a Vic20 with joystick and Super Expander cartridge It allows you to specify the start position and the screen border and plot colours

The program has two modes — one allows you to draw, while the other allows you to rub-out. The rub-out mode can also be used to move the cursor without actually drawing The program also produces a flashing cursor in both modes

The program starts by displaying instructions The user is than asked to input the required resolution which should be in the range 1-3 (1 & 3 being multi-colour modes and 2 being the highest resolution)



Next the user is required to input the screen border and plotting colours These should all be in the range 0-15, according to the colour list in the Super-Expander manual The program is mug-trapped for incorrect inputs

If the user wants to rub-out, or move without drawing, then he must press the arrow key next to the "1" key The cursor will then rub-out any points drawn on the screen If no points have been plotted the cursor will move without making any lines To re-start drawing, the user simply pushes the '1' key

The user may also clear the screen at any time by pushing the space-bar He may also leave the program by pushing the '*' key

The variables are

Plot co-ordinates — x y
R is the resolution
sc is the screen colour
bc is the border colour
pc is the plotting colour
Z determines draw or erase mode

commodore
VIC-1211A
SUPER EXPANDER WITH 3K RAM CARTRIDGE

```
READY.

10 REM SKETCHPAD
20 REM FOR VIC-20 + SUPER EXPANDER
30 REM AND JOYSTICK
35 REM (C) R.P.MORGAN
40 PRINT"          ***********"
50 PRINT"     *               *"
60 PRINT"     * SKETCHPAD *"
70 PRINT"     *               *"
80 PRINT"      ***********"
90 PRINT" USE A JOYSTICK TO
   DRAW ON THE HI-RES    SCREEN."
100 PRINT" PRESS ← TO RUB-OUT,
    THEN 1 TO RE-START    DRAWING."
105 PRINT" PRESS [SPACE] TO
    CLEAR SCREEN."
110 PRINT" PRESS * TO END."
115 PRINT"        PRESS A KEY
    "
120 POKE198,0 WAIT198,1 POKE198,0
130 PRINT"INPUT START COOR
    DINAT-ES (X,Y)" INPUTX,Y
140 IF(XORY)<0OR(XORY)>1023
    THEN130
150 INPUT"RESOLUTION ",R IFR<1
    ORR>3THEN150
160 INPUT"SCREEN COLOUR ",SC IF
    SC<0OR SC>15THEN160
170 INPUT"BORDER COLOUR ",BC IF
    BC<0OR BC>15THEN170
180 INPUT"PLOT COLOUR ",PC IFPC
    <0ORPC>15THEN180
190 GRAPHICR Z=2
200 COLORSC,BC,PC,0
210 A=RJOY(0, GETA$
220 POINTZ,X,Y
230 X=X-(A=8)+(A=4)
240 Y=Y-(A=2)+(A=1)
250 IFA=5THENX=X-1 Y=Y-1
260 IFA=9THENX=X+1 Y=Y-1
270 IFA=6THENX=X-1 Y=Y+1
280 IFA=10THENX=X+1 Y=Y+1
285 POINT2,X,Y
290 IFA$="←"THENZ=0
300 IFA$="1"THENZ=2
310 IFA$=" "THEN500
315 IFA$="*"THEN700
320 POINT0,X,Y
330 GOTO210
500 SCNCLR GOTO320
700 GRAPHIC0 PRINT"" END

READY.
READY.
```

Hard grind no longer

***David Lawrenca** presents a melody maker program for* Saving *tunes on cassette*

Hopefully no one who owns a Spectrum is too disappointed by the fact that the aptly named *Beep* command is never going to amaze their friends with concert grade sounds. Even if you accept the limitations of the Spectrum's single-channel sound, its lack of flexibility is something of a let-down. Anyone who has tried to program even the simplest tune will know just what a chore it can be.

What you need is a flexible method of entering, correcting and storing tunes on the Spectrum. This program sets out to do just that. As it stands, the program allows the user to develop up to 50 tunes on a 48K Spectrum, to store them by name and to recall them at a later date.

The main routine within the program lies between lines 1190 and 1450. It permits the user to input notes in the form of numbers from 1-24 (representing the notes of three octaves in the key of C major). Note duration may also be input in units of 64ths of a second. The functions available in this routine are as follows:

- *A* — add notes to the end of the tune so far developed
- *I* — insert one or more notes after any specified notes
- *D* — delete any specified note
- *N* — delete whole of current tune under development
- *S* — place current tune in dictionary after naming it.
- *P* — play whole of current tune
- *L* — list up to 40 notes in the current tune, from a specified starting point.
- *Z* — quit this section of the program
- *PP* — play part of the current tune between specified points

Apart from this routine, the program also allows you to delete tunes already placed in the dictionary and to call up named tunes which have been stored previously. Tunes may be recalled to be played, to be developed further (the tune recalled becomes the current tune for the purpose of the main routine described above), or for the tune's data to be stored on cassette. Once stored on cassette, the data may be picked up by other programs and replayed by the use of a short routine such as that shown in listing 2.

Owners of 16K machines will not be able to make full use of the dictionary of stored tunes, especially since the tunes are stored in undimensioned strings — fast for insertion and deletion but expensive on memory due to the Spectrum's annoying habit of creating momentary shadow strings when adding characters to a variable length string. There is no reason, however, why users of 16K machines should not use the routine which develops and saves such tunes for use by other programs. More musically advanced readers may like to add a provision to change the tempo and key of tunes on replay, using methods like those outlined in the relevant chapter of the Spectrum manual.

Commentary

1300 & 1270 The variable PLACE is used to dictate the point at which new notes are added to the string M$ which contains the files for the tune under development.

1260 Note the ease with which 2 characters may be deleted using Sinclair Basic's flexible string slicing.

1320 This line reprints time values for listing — the first character in each character pair stores the actual note in the form of a CODE value, the second character stores the duration of the note.

1390 Note that there is a provision for a pause in the tune. This is achieved by entering 0 for the note value and the appropriate figure for the duration.

1600 Note that the names of tunes to be stored are placed in the array N$. M$ is added to the dictionary by tacking it on to the end of the variable length string S$, recording its start and finish position in the array S. The variable TUNES records the number of tunes stored + 1. Note also that a space is always added to the end of S$ in order that, when deleting entries from the dictionary, the program does not generate an error message by referring to a position in the string which does not exist (see line 1800).

1420-1440 These lines permit the actual entry of notes and places them into the tune currently under development.

1460 LIMIT1 and LIMIT2 are used to allow the user to specify start and finish points for playing a tune. This line sets them when the whole of the tune is to be played.

1700 Note here how the values in the array S are used to quickly pick up the specified portion of the whole dictionary.

1715 You may wonder why a special string, X$ is created here. The answer is that an undimensioned string cannot be successfully saved and loaded again.

1800 Note again how easily an entry is deleted from the dictionary using the Spectrum's flexible string handling.

```
1000 REM ************************
1010 REM MENU
1020 REM ************************
1030 INK 0: PAPER 7: CLS : PRINT
 AT 0,0; PAPER 2; INK 7;"
  MELODY MAKER"
1040 PRINT '"FUNCTIONS AVAILABL
E": INVERSE 1
1050 PRINT '"1) CREATE NEW TUNE"
1060 PRINT '"2) PLAY/SAVE DICTIO
NARY TUNE"
1070 PRINT '"3) DELETE TUNE"
1080 PRINT '"4) INITIALISE"
1090 PRINT '"5) STOP"
1100 INPUT Z: INVERSE 0: CLS
1110 IF Z=1 THEN GO SUB 1190
1120 IF Z=2 THEN GO SUB 1640
1130 IF Z=3 THEN GO SUB 1730
1140 IF Z=4 THEN GO SUB 1560
1150 IF Z=5 THEN GO TO 1170
1160 CLS : GO TO 1000
1170 INPUT "DO YOU WISH TO RE-SA
VE? ",G$: IF G$="Y" THEN SAVE "M
USIC": BEEP 1,30: PRINT "REWIND
THEN ANY KEY TO VERIFY": PAUSE 0
: VERIFY "MUSIC": BEEP 1,30: PRI
NT INVERSE 1;"PROGRAM VERIFIED"
: STOP
1180 STOP
1190 REM ************************
1200 REM INPUT NOTES
1210 REM ************************
1220 INPUT "A=ADD,I=INSERT,D=DELN=
NEW,P=PLAY,L=LIST,Z=QUIT,PP=PAR
TS,S=SAVE ";Q$
1230 IF Q$="N" THEN LET M$=""
: GO TO 1220
1240 IF Q$="A" THEN LET PLACE=LE
N M$-1: GO TO 1420
1250 IF Q$="I" THEN INPUT "INSER
T AT? ",PLACE: LET PLACE=2*(INT
PLACE+.5): GO TO 1420
1260 IF Q$="Z" THEN RETURN
1270 IF Q$="D" THEN INPUT "DELETE
 NUMBER? ",PLACE: IF PLACE>=LEN M
$/2 THEN LET PLACE=LEN M$/2
1280 IF Q$="D" THEN LET M$=M$( T
O 2*PLACE-1)+M$(2*PLACE+2 TO )
: GO TO 1220
1290 IF Q$<>"L" THEN GO TO 1350
1300 INPUT "START POINT? ",START
: CLS : FOR I=0 TO 1: FOR J=0 TO
 19: IF 2*(START+J+20*I)+1>=LEN
M$ THEN GO TO 1190
1310 PRINT AT J,16*I;START+J+20*
I;" ";
1320 IF CODE M$(2*(START+J+20*I)
)<>0 THEN PRINT CODE M$(2*(START
+J+20*I)),"/";CODE M$(2*(START+J
+20*I)+1): GO TO 1340
1330 PRINT "PAUSE/";CODE M$(2*(S
TART+J+20*I)+1)
1340 NEXT J: NEXT I: GO TO 1190
1350 IF Q$="P" THEN GO SUB 1460:
 GO TO 1190
1360 IF Q$<>"PP" THEN GO TO 1390
1370 INPUT "START POINT? ",START
: LET LIMIT1=START*2: INPUT "FIN
ISH POINT? ",FINISH: LET LIMIT2=
FINISH*2: IF LIMIT2>LEN M$-2 THE
N LET LIMIT2=LEN M$-2
1380 GO SUB 1500: GO TO 1220
1390 IF Q$="S" AND TUNES>48 THEN
 PRINT "NO ROOM": GO TO 1220
1400 IF Q$="S" THEN INPUT "NAME
OF TUNE? ";N$(TUNES): LET M$=M$(
2 TO LEN M$-1): LET S(TUNES)=LEN
 S$: LET S(TUNES+1)=LEN S$+LEN M
$: LET S$=S$( TO LEN S$-1)+M$+"
": LET TUNES=TUNES+1: GO TO 1220
1410 GO TO 1220
1420 INPUT "NOTE ";NOTE,"DURA
TION ";DURATION: IF NOTE=0 A
ND DURATION=0 THEN GO TO 1220
1430 LET M$=M$( TO PLACE)+CHR$ N
OTE+CHR$ DURATION+M$(PLACE+1 TO
)
1440 LET PLACE=PLACE+2
1450 GO TO 1420
1460 REM ************************
1470 REM PLAY TUNE
1480 REM ************************
1490 LET LIMIT1=2: LET LIMIT2=LE
N M$-2
1500 FOR I=LIMIT1 TO LIMIT2 STEP
 2
1510 IF CODE M$(I)=0 THEN PAUSE
CODE M$(I+1)/64*50: GO TO 1530
1520 BEEP CODE M$(I+1)/64,N(CODE
 M$(I))
1530 NEXT I
1540 RETURN
1550 REM ************************
1560 REM NOTE VALUES
1570 REM ************************
1580 DATA 0,2,4,5,7,9,11,12,12,1
4,16,17,19,21,23,24,24,26,28,29,
31,33,35,36
1590 RESTORE : DIM N(24): FOR I=
1 TO 24: READ N: LET N(I)=N: NEX
T I
1600 LET M$=""
1610 LET TUNES=1: LET S$=" "
1620 DIM N$(50,20): DIM S(50)
1630 RETURN
1640 REM ************************
1650 REM PLAY NAMED TUNE
1660 REM ************************
1670 IF TUNES=1 THEN RETURN
1680 CLS : FOR I=1 TO TUNES-1: P
RINT I;") ";N$(I): NEXT I
1690 INPUT "WHICH NUMBER DO YOU
REQUIRE? ",TUNE: IF TUNE>=TUNES
THEN PRINT "TOO BIG.": PAUSE 150
: RETURN
1700 LET M$=" "+S$(S(TUNE) TO S(
TUNE+1)-1)+" "
1710 LET LIMIT1=2: LET LIMIT2=LE
N M$-2: GO SUB 1500
1715 INPUT "DO YOU WISH TO SAVE
THIS TUNE ONTAPE? (Y/N) ",G$: IF
 G$="Y" THEN DIM X$(LEN M$): INP
UT "NAME, UP TO 10 CHARACTERS? "
;G$: SAVE G$ DATA X$(): BEEP 1,3
0: PRINT "REWIND THEN ANY KEY TO
 VERIFY": PAUSE 0: VERIFY G$ DAT
A X$(): BEEP .1,20: BEEP .1,20:
BEEP .1,10
1720 RETURN
1730 REM ************************
1740 REM DELETE TUNE
1750 REM ************************
1760 IF TUNES=1 THEN RETURN
1770 CLS : FOR I=1 TO TUNES-1: P
RINT I;") ";N$(I): NEXT I
1780 INPUT "WHICH NUMBER TO BE D
ELETED? ",TUNE: IF TUNE>=TUNES T
HEN PRINT "TOO BIG.": PAUSE 150
: RETURN
1790 LET LENGTH=S(TUNE+1)-S(TUNE
)
1800 LET S$=S$( TO S(TUNE)-1)+S$
(S(TUNE+1) TO )
1810 FOR I=TUNE TO TUNES-1: LET
N$(I)=N$(I+1)
1820 LET S(I)=S(I+1)-LENGTH: NEX
T I
1830 LET TUNES=TUNES-1
1840 RETURN
```

```
  10 FOR I=2 TO LEN M$-1 STEP 2
  20 IF CODE M$(I)=0 THEN PAUSE
CODE M$(I+1)/64*50: GO TO 40
  30 BEEP CODE M$(I+1)/64,N(CODE
 M$(I))
  40 NEXT I
```

Impressed in the memory

Keith and Steven Brain present a diary program for 1983

Following our demonstration of how to impress your friends and relatives by getting your Dragon to help you with the Christmas chores (*Popular Computing Weekly*, December 16/23) we came up with a 1983 Computer Diary. This uses a large array and some tricky slicing and scrolling techniques to produce a computer diary which can be used just like any other. The virtually instantaneous speed at which the string slicing and the array manipulation takes place shows the power of the direct addressing of the 6809 CPU and the Microsoft Extended Color Basic.

Enter this program, press Run, and a 1983 calendar will be produced. Of course this will not all fit on the screen at once — the initial display only shows the first few days of January, with a flashing cursor on the first date. This is no problem as you can scroll the screen up and down with the arrow keys to display any part of the year. If you use shifted arrow keys everything moves 10 times faster.

To use this program as a diary you can add text to the right-hand side of the screen by pressing the *A* key twice. Your entry is line input and can be edited as usual, at the bottom of the screen before being entered into the array and displayed on the screen. Since the day and date displays take up the first six characters, this appears to limit the amount of information you can include. But, fear not, if you try the right and left arrow keys (and their shifted versions) you will find you can move the text to left and right.

In fact any particular line can be up to 255 characters long, and any 25 of these characters can be shown at any one time. The whole diary will be filled when there is an average of about 55 characters a line. If you now add more information, it will be put in front of the first character in the text display (ie in front of what is already there). If you want to add it behind this then simply move the line to the left before adding.

If you want to delete something just press *D* twice and the first character in the display will be deleted.

Once you have added all the information you want, then you can *Save* your diary as a data file on cassette, by setting up your recorder and then pressing *S* for *Save*. To recall this at a later date, just *Skipf* to the start of this file and press *L* to *Load* it back.

Once the program has been Run the first time and the array saved, lines 20-170 which set up the calendar as the first six characters of each array element can be deleted.

Program explanation

Line 10 makes space (24000 characters) and sets up the array (*A$*(377)) and diary display line length (*B*). *Dy$* contains the abbreviations for the days of the week. Lines 10-130 and line 170 contain subroutines making the first two characters in each array element the appropriate month title and the next two characters the day of the month.

Line 170 truncates the three characters produced by taking the *Str$* value of *Mo* to two to save space. Lines 135 and 136 add the running instructions which are displayed while lines 140-160 add the date and the day of the week to the array elements.

Line 160 is the start of the running routine and sets the display position in the array (*D*) to 7 (January 1). Line 190 prints out the first 13 elements of the array (five blanks + Jan 1-8). Line 200 checks for *Inkey$* and, if there is no key pressed, draws a flashing cursor by looking at the value present at the start of the line.

Line 300 checks if *D* for delete has been pressed and if so displays a flashing cursor at the start of the text part of the display. When *D* is pressed again to confirm that the position is correct the program goes to the delete subroutine at line 360. Line 310 similarly checks for *A* to add, and leads to the add subroutine at line 370.

The delete subroutine at 360 divides the displayed text string at the left hand end leaving out the first displayed character. The add subroutine at 370 requests a line input which can be corrected before entering with the normal editor facility. If the maximum string length (255) is reached an error message is printed and the line input is discarded.

```
10 PCLEAR1 CLEAR24000 CLS PRINT@66,"COMPUTER  1983  DIARY";
   PRINT@258 "CALENDAR
 UNDER CONSTRUCTION"; PRINT@450,"COPYRIGHT K & S BRAIN 121282"; B=25:
   DIMA$(377) DY$="sasumotuwethfr"
20 FORY=1TO31 MO=Y M$="ja" GOSUB170 NEXT
30 FORY=32TO59 MO=Y-31 M$="fe" GOSUB170 NEXT
40 FORY=60TO90 MO=Y-59 M$="ma" GOSUB170 NEXT
50 FORY=91TO120 MO=Y-90 M$="ap" GOSUB170 NEXT
60 FORY=121TO151 MO=Y-120 M$="my" GOSUB170 NEXT
70 FORY=152TO181 MO=Y-151 M$="ju" GOSUB170 NEXT
80 FORY=182TO212 MO=Y-181 M$="jy" GOSUB170 NEXT
90 FORY=213TO243 MO=Y-212 M$="au" GOSUB170 NEXT
100 FORY=244TO273 MO=Y-243 M$="se" GOSUB170 NEXT
110 FORY=274TO304 MO=Y-273 M$="oc" GOSUB170 NEXT
120 FORY=305TO334 MO=Y-304 M$="no" GOSUB170 NEXT
130 FORY=335TO365 MO=Y-334 M$="de" GOSUB170 NEXT
135 CLS2 PRINT@64,"TO ALTER DATE USE UP/DOWN ARROWS"; PRINT@128,"TO
    SCROLL TEXT
USE L/R ARROWS"; PRINT@192,"TO MOVE FASTER USE SHIFTED ARROW";
    PRINT@256,"TO ADD
 CHARACTERS USE 'A' "; PRINT@320,"TO DELETE CHARACTERS USE 'D' ";
136 PRINT@384 "TO SAVE TO CASSETTE USE 'S'"; PRINT@448,"TO LOAD FROM
    CASSETTE US E 'L' ";
140 FORYE=6TO370STEP7 Y=YE FORD=1TO13STEP2 Y=Y+1 IFY=372THEN180
150 D$=MID$(DY$,D,2) A$(Y)=A$(Y)+D$
160 NEXTD YE
170 A$(Y+6)=M$+RIGHT$(STR$(MO),2) RETURN
180 CLS D=7
190 A=1 PRINT@0 "", FORN=(D-6)TO(D+6) PRINTMID$(A$(N),1,B+5) NEXT
200 I$=INKEY$ IFI$="" THENZ=PEEK(1216) POKE1216 155 POKE1216 2 GOTO200
    ELSEI=ASC(
10) IFI=94THEN D=D-1
210 IFI=10THEND=D+1
220 IFI=95THEND=D-10
230 IFI=91THEND=D+10
240 IFD<7THEND=7
250 IFD>371THEND=371
260 IFI=8THENA=A+1 GOTO340
270 IFI=9THENA=A-1 GOTO350
280 IFI=21THENA=A+10 GOTO340
290 IFI=93THENA=A-10 GOTO350
300 IFI=68THENTE=PEEK(1222) POKE1222,151 POKE1222,TE I$=INKEY$
    IFI$<>"D" THEN300 ELSE360
310 IFI=65THENTE=PEEK(1222) POKE1222 159 POKE1222,TE I$=INKEY$
    IFI$<>"A"THEN310 ELSE370
320 IFI=76THEN390
330 IFI=83THEN380ELSE190
340 IF(A)249THENA=249 GOTO200 ELSEB$=MID$(A$(D) A+6,B) PRINT@198 B$
    GOTO200
350 IF A<1THENA=1 GOTO200 ELSEB$=MID$(A$(D),A+6 B  PRINT@198 B$
    GOTO200
360 AA$=MID$(A$(D) 1 A+5) AB$=MID$(A$(D),A+7) A$(D)=AA$+AB$ B$=
    MID$(A$(D  A+6 B)  PRINT@198 B$ GOTO200
370 PRINT@416  ADD^  LINE INPUTAC$ AA$=MID$(A$(D) 1 A+5) AB$=MID$(
    A$(D) A+6) IF
LEN(AA$)+LEN AB$)+LEN(AC$)<255THENA$(D =AA$+AC$+AB$ B$=MID$(A$(D)
    A+6 B) PRINT@1
98,B$  PRINT@416       GOTO200 ELSEPRINT@416    LINE NOW TOO LONG
    GOTO200
380 OPEN O  #-1 "DI/DATA" FORN=1TO377 PRINT#-1 A$(N) NEXT CLOSE#-1
    GOTO180
390 OPEN I" #-1,"DI/DATA" FORN=1TO377 IFEOF(-1)THEN400ELSEINPUT#-1
    A$(N)  NEXT
400 CLOSE#-1 GOTO190
```

Is there anything about your computer you don't understand, and which everyone else seems to take for granted? Whatever your problem *Peek* it to Ian Beardsmore and every week he will *Poke* back as many answers as he can. The address is *Peek & Poke, PCW*, Hobhouse Court, 19 Whitcomb Street, London WC2 7HF.

WATCHING WHEN YOU HIT THE WALL

D Soards of Worlds End, Kelvedon, Essex writes

Q **I have recently acquired a BBC model A micro. I am now trying to write a *Pacman* type program. But, as with *Space Invaders* and other similar programs, I have a problem. How do you know if your *Pacman* has hit the wall of a maze? Is there a simple way to find this out?**

A Perhaps the easiest way to do this would be to use the *Point* command. The *Point* command returns a logical number for a colour found at a set of co-ordinates (*x,y*). So if you were using two colours it would return 1 or 0, if you were using four colours then 0 – 3, and so on.

Thus, if the walls of your maze, or your space invader, are a particular colour, and your *Pacman* or missile another colour, all you have to do is keep track of their relative positions. These coordinates would then be read by a line to the effect *If Point (x,y) = a Then* ... where a is the colour code number of your invader. Then, if the position of your missile at *x,y* is the same as a point that has the colour of an invader, the program will *Goto* or *Gosub* a 'hit' routine.

A line like *If Not Point (x,y) = a Then* ... would let the program continue on its way if a 'hit' has not been scored.

YOU WEREN'T LUCKY LAST TIME

B H Norton of Beech Avenue Willerby, Hull, writes

Q **My first 16K Spectrum had to be replaced. My new one has the redesigned circuit board. If I accidentally leave the Ear connection in when I am *Saving* or *Verifying*, programs are not lost as they were with the original machine. Is this an unannounced enhancement or am I just lucky as I now have sufficient confidence to leave the connections in all the time? I would just like to make sure that no damage is being done. I have a Binatone recorder with auto record level, that I used with both of the Spectrums.**

A I can assure you that no damage is being done and you are not lucky in having an unspecified enhancement. Instead, you were unlucky in that the first Spectrum you had did not work properly. You should be able to leave both the Ear and the Mic lead in all the time without causing damage and without losing a program after executing the *Save* command.

I have already mentioned about chickens coming home to roost with regard to the *Load/Save* problems of the ZX81 being transferred to the Spectrum. Just to repeat this point, because it is still the cause of quite a few letters, the Spectrum's *Load/Save* functions have been considerably enhanced when compared to the ZX81. There should be no problems as long as the instructions in the manual are followed.

LAGGING BEHIND IN GCE MARKET

Elizabeth Hogarth of Ladysmith Avenue, Whitby, writes

Q **I would like to ask your assistance about computer tapes for GCE exams. I have a 16K Spectrum on order and wish to acquire some educational tapes. Are there any for the 16K Spectrum? If so, could you tell me how much they cost, and where I could get them from?**

A At the moment the educational market for the ZX Spectrum seems to be lagging behind the games market, but the same thing happened with the ZX81. I do not think that you will see a lot of educational material coming out for the Spectrum till later in the year.

It would seem that the companies producing educational software for the ZX81 are developing software for the Spectrum. The main companies here are Calpac, 108 Hermitage Woods, St Johns, Woking, Surrey, AVC Software, PO Box 415, Birmingham 17, Sason Computing, 3, St Catherines Drive, Leconfield, Beverley, Humberside.

EZUG (Educational ZX Users Group), of Highgate School Birmingham is geared specifically to the use of ZX computers in education. It ought be best to write to them first. Please enclose a SAE and ask for any information they have.

YES, BOTH ARE CORRECT

Adrian Comley of Five Acres, Charmouth, Dorset writes

Q **I have two questions. First, in your magazine of November 4, in your letters page, someone wrote and said that he had a 3.5K Vic20. The specification says that there is 5K Ram. Which is correct?**

The second question concerns the Vic tape recorder. Some people say that only Commodore's tape recorder can be used with the Vic20. Is this true?

A As regards the Vic's memory there is 5K of it. However, all computers need to use some of this Ram to store variables, and some to store the screen. On the Vic this takes up 1.5K. So, the 5K Ram specification is correct, but with only 3.5K available to the user.

A similar situation occurs with the ZX Spectrum which has a 16K specification, but only 9K available to the user.

Commodore's tape recorder is the only one designed to work with the Vic20.

RECOMMENDED FOR COBOL

Graham Scales of Shakespeare Avenue, Hayes, Middlesex writes

Q **I am now fairly confident that I have mastered Basic. But I am going to delve into Cobol and I was hoping you could tell me if there are any good books on the subject. Also, are there any plans to bring out binders for *Popular Computing Weekly*?**

A There are many books on Cobol. Two that have been recommended to me are *Cobol for Beginners* by T Worth, published by Prentice Hall (ISBN 0131393782), which is expensive, and *A Simplified Guide to Structured Cobol Programming* published by Wiley (ISBN 0471582840).

I feel that your best choice, as you live near London, would be to go up to Foyles Bookshop in the Charing Cross Road, or Dillons University Bookshop in Mallett Street. Both have a good selection of computer books from which you could make a more informed choice.

While on the subject of books, I have recently seen *Georges Computer Book Catalogue* which lists over 3,500 computer books, including over 50 on Cobol. Not a book for the casual buyer but it would be useful for the serious programmer. Georges are based at 89, 81 and 52 Park Street, Bristol BS1.

There are no plans to bring out binders immediately, but they may appear later.

THE SHAPE OF THINGS TO COME

Les Wynne of Gress Road, Crawley, Sussex writes

Q **I have an Atari 400 and am quite pleased with it. But I would like to build some electronic projects for it. As the Amber printer uses a joystick port, it appears that it can be reconfigured to act as an input/output port. It would certainly make some of the projects I would like to try a great deal easier as well as extending the range of the computer.**

If it can be reconfigured can you tell me how, which bits go to which ports, and where in the memory the joysticks are stored?

A Yes, the joystick port can be reconfigured, and it would be useful to do as many projects need an input/output port to work. I telephoned Atari, and they suggested that the *Hardware Operation Users Manual* and *De Re Atari* be consulted. At the time of writing I have not been able to take a look at either but they should both be available from Atari and Atari approved dealers.



Battlestar

Enemy ship straight ahead sir I think he's a Hornet and its within range of our lasers Shall we attack or should we drop down one orbit to avoid the Scared coming up behind? This is just one of the possible scenarios that could face you in *Battlestar* — a computer moderated play by mail game

Devised specially for *Popular Computing Weekly* by Starlord organiser Mike Singleton, *Battlestar* is centred around one of the Empire's fortress planets *Knox II*. Located near the outer rim of the Milky Way in the seventh quadrant, *Knox II* holds one of the Empire's last treasure vaults The fleet of Empire starships guarding the planet have been called away to put down a rebellion leaving the treasure vault unguarded save for robot controlled missile stations

There are 40 moons orbiting Knox II 35 in an outer ring and five in an inner ring Each moon also contains a number of robot controlled missile stations and one port dome

Each player controls a fleet of eight ships and starts at one of the outer moons The ships circle the moon counter clockwise travelling in various orbits The speed of the ships depends on the height of the orbit — the higher the orbit, the slower the speed

The players must manoeuvre their ships as close as possible to the port dome while avoiding asteroids missile bases and each other A matter transmitter in the port dome operates automatically after three turns The ship closest to the port dome (and the rest of that player's fleet) is transported to one of the inner moons The remaining players on the outer moon are eliminated from the game

This process is repeated on the inner moons so that five players are transported to *Knox II* The winning player whose ship is closest to the port dome on Knox II is transported to the treasure vault

At the start of the game each player will receive a set of rules and a colour print-out showing one of the outer moons The player's own ships will be coloured blue while enemy ships will be either red brown yellow green purple or orange

After studying the print-out, each player decides on his moves for that turn and posts them back together with a stamped (first class) addressed envelope and a coupon from *Popular Computing Weekly* All the moves are then fed into a computer which generates a new print out showing the current positions of all the ships Each turn takes two weeks

We shall report on the progress of *Battlestar* in future issues of *Popular Computing Weekly*

In order to limit numbers to a manageable size we have devised a preliminary competition All you have to do is answer five simple questions on the form below and send it with a SAE to *Battlestar Popular Computing Weekly*, Hobhouse Court 19 Whitcomb Street London WC2 But hurry only the first 245 correct solutions will be entered into *Battlestar* proper

The *Battlestar* entry form will be repeated in the January 20/27 issues of *Popular Computing Weekly*

Entries for the *Battlestar* competition will close on January 31 The solution to the preliminary competition will be published on February 3

Prizes

a) The winner will receive a ZX Spectrum
b) The four losing semi finalists will each receive a ZX81
c) Each of the 245 winners of the preliminary competition will receive a voucher entitling them to £10 off a ZX Printer

Popular Computing Weekly Battlestar

To enter *Battlestar* all you have to do is answer the five questions below fill in your name, address and telephone number and send the form with a SAE to *Battlestar Popular Computing Weekly* Hobhouse Court 19 Whitcomb Street London WC2

Rules

a) Each entry must be made on a form out from *Popular Computing Weekly*
b) Only one entry per person
c) Closing date for entries is January 31
d) The Judges decision is final
e) No employees of Sunshine Publications Ltd or their families will be eligible to enter *Battlestar*

Questions

1) Which actor played Han Solo in *Star Wars* and Deckard in *Blade Runner*?
2) Which film is the sequel to *Star Wars*?
3) What do the letters *MCP* stand for in the film *Tron*?
4) What are the names of the two robots in *Star Wars*?
5) Where is *ET* trying to phone?

Name

Address

Tel No

Answers

1)

2)

3)

4)

5)

CLASSIFIED

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SPECTRUM SOFTWARE, 16K/48K. Please send sae for details. Softrax 24 Sydenham Buildings Bath Avon

VICS 20 34 BBC (A/B)

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Stanwell

Middlesex TW19 7 SO

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16K ZX SPECTRUM with 2 games £130.00 Tel 01 554 6389

SPECTRUM 16K 4 months old £100.00 Tel 01-451 3083 after 6 pm

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SINCLAIR SPECTRUM 16K including software almost new £115.00 Tel Keeden (East Sussex) 6384

SPECTRUM 16K plus keyboard and case, 2 cassettes £180.00 Tel Maidstone 63217

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ZX81 16K + software + books also cassette recorder + TV price negotiable Tel 888 0614

ZX81, 16K DK Tronics cased keyboard graphics Rom 10 bought games three ZX81 books worth £18 worth £250 will accept £125 Tel 01 573 8341

ZX81 16K 4K Graphic Rom 5 books 30 cassettes £100 ono Ian White Harpenden Herts Tel 2907

ZX81 + 16K Ram + unused printer + manual + leads £115 ono Rita Hiee 6K Kensington Mansions Trebovir Road London SW5

ZX81 DK Tronics k/brd + case sound generator quick save loading interface joysticks £80 of software manual PSV etc £140 ono or swap for Spectrum Tel Martin Coxtie Green 73343

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SINCLAIR ZX81, with 16K Rampack, printer manuals £40 of software still under guarantee £100 Tel 01-381 9081 evenings

ZX81, 1K + some mags £40 Tel Preston (Lancs) 795014

16K ZX81 with software 3 months old excellent condition, £50 Tel 0761 232351 after 5 pm

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ZX81 16K. 6 games tapes £55.00 ono Simon Cannell Tel 01 554 6389

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ZX81 plus Ram pack 3 months old, plus DK Tronics keyboard plus software plus manuals £80.00 Tel High Wycombe 711678

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ZX81 plus 16K Ram 8 tapes plus instruction book Tel (Medway) 0634 405321

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ZX81 16K cassettes magazines £80.00 ono Tel Weybridge 56751

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PET 3032/2001 32K, basic 4 extl kit, super chip reset cassette deck manuals Hampshire Pet books 75 pcw pc/byte mags 30 cassettes including some utility/games software £450 ono Tel Miller 01 979 9628

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Wanted

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Ziggurat



ET come home

To lose one event is unfortunate but to lose two events is rather careless as Lady Bracknell might have said

The first event to be lost was IT'82 (Information Technology Year 1982) While some of you will have been aware of IT'82 the majority will have been untouched by its existence

A recent Mori poll (November 1982) has discovered that of the 2,000 people interviewed 37 percent had never heard of information technology A further 40 percent knew almost nothing and only 23 percent said they had more than the faintest idea of what information technology meant.

The second lost event and the indicator of carelessness was The IT'82 Conference Held on December 8 9, it hardly made the non-computing press (despite being honoured by the presence of Margaret Thatcher who gave the keynote address) The Conference seemed (to one who attended) to be a very self congratulatory affair with only token dissent — from those of us sick of jokes about the failures of technology whenever the gadgetry failed

Personally I was fed up with being told that people who were wary of information technology were like those who had wanted to have a man with a red flag in front of early cars

As the keynote speech, the Prime Minister's address although beautifully delivered by use of an auto-cue was full of conventional platitudes And I noticed in a type-script of her presentation that computer program was spelt programme — a little mistake but one which indicates that the Prime Minister and her script writers are not truly aware of the subject

According to Margaret Thatcher information technology is friendly and offers a helping hand 'We should think of it more like ET than IT, she said ET went and left us

It was a tub-thumping speech We were reminded of the 82 Nobel Prizewinners in Science who were British and we were told that we did not proclaim our successes loud enough The 82 prizewinners were remembered at many times in the succeeding debates usually to the effect So what? Does it mean anything? Kenneth Baker (Minister for Information Technology) in his concluding speech went outside his prepared script to ask 'What is the use of Nobel Prizewinners if they do not go into the market place?

The tub was given another thump for Clive Sinclair whose profits have jumped astronomically Margaret Thatcher asked for applause for his efforts because we should preach the success Britain can achieve and we are all British My two neighbours (both of whom were Dutch) did not agree The Prime Minister then realised that on the platform with her was Etienne Davignon vice-president of the European Commission M Davignon is Belgian

One of the big news items at the conference was the cabling of Britain something which was seen by some interested parties as a means of producing fortunes and jobs Margaret Thatcher noted that cable was being resisted in some quarters, but (she said) the same arguments were put forward about ITV 25 years ago 'They were wrong then and they'll be wrong again we heard Interestingly ITV is being watched less now than at any time in the last 25 years

Remember how we were all being encouraged to build skate-board parks? Some of us said they would be a waste of time and we were right then

Mori told us that in 1961 88 percent of those polled knew about micro-electronics This year it was 82 percent ■

Boris Allen

Top 10



Atari

1(1)	Preppie	(Adventure International)
2( )	Sea Dragon	(Adventure International)
3(3)	Air Strike	(English Software)
4(5)	Submarine Commander	(Thorn EMI)*
5( )	Alien Chase	(First Star Software)†
6(–)	Temple of Apshai	(Epyx)†
7(–)	Stratos	(Adventure International)
8(6)	Snooker and Billiards	(Thorn EMI)*
9( )	Alien Swarm	(Inhome Software)
10(–)	Ghost Hunter	(Arcade Plus)

*Cartridge †32K cassette.
(Figures compiled by Calisto Computers Birmingham 021-632 5458)

ZX81

1(–)	Micro Crystal	(Carnell Software)
2(6)	Gauntlet	(Colourmatic)
3(2)	3D Defender	(JK Greye)
4(5)	Gulp II	(Campbell Systems)
5(8)	Adventure 1	(Abbersoft)
6( )	Espionage Island	(Artic)
7(7)	Flight Simulation	(Psion)
8(9)	3D Monster Maze	(JK Greye)
9(1)	Frogger	(DJL Software)
10( )	Arcade Park	(C Tech)

*All 16K
(Figures supplied by Buffer Micro Shop London 01 769 2887)

Spectrum

1( )	The Hobbit	(Melbourne House)*
2(–)	Penetrator	(Melbourne House)
3(4)	Orbiter	(Silversoft)
4(–)	Micro Crystal	(Carnell Software)*
5(1)	Time Gate	(Quicksilva)
6( )	Mazeman	(Abbersoft)
7(3)	Escape	(New Generation)
8(8)	Football Manager	(Addictive Games)*
9(9)	Night Flite	(Hewson)
10(7)	Rocks File	(Campbell Systems)*

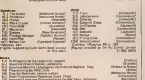
*Requires 48K.
(Figures supplied by Buffer Micro Shop London 01 769 2887)

Vic20

1(1)	Traxx	(Llamasoft)†
2(3)	Jellymonsters	(Commodore)*
3(4)	Defenda	(Llamasoft)†
4(2)	Sargon II Chess	(Commodore)
5(5)	Grid Runner	(Llamasoft)
6(8)	Star	(Commodore)
7(E)	Abductor	(Llamasoft)
8(7)	Myriad	(Rauce)
9( )	Pirates Cove	(Commodore)*
10(9)	Adventureland	(Commodore)

Cartridge †Requires 8K or 16K.
(Figures compiled by the Vic Centre London 01-992 9904)





Books

1(7)	35 Programs for the Dragon 32, Langdell	(Century)
2(–)	Spectrum Book of Games, James et al.	(Granada)
3(1)	Spectrum Machine Language for the Absolute Beginner Tang	(Melbourne House)
4(8)	Programming the 6502, Zaks	(Sybex)
5(6)	Over the Spectrum, various authors	(Melbourne House)
6(–)	Vic20 Programmers Reference Guide Finkel	(Commodore)
7(3)	Assembly Language Programming for the BBC Micro Birnbaum	(Macmillan)
8(–)	ZX Spectrum Sinclair	(Granada)
9(–)	Discover Forth, Hogan	(Osbourne)
10( )	30-hour Basic Prigmore	(NEC BBC)

(Figures compiled by Watford Technical Books, Watford 0923 23324)
(Last week's position in brackets)

Puzzle

There and back again

Puzzle No 38

A palindrome is a word or sentence that reads the same forwards as backwards 'MADAM I M ADAM is probably the best known example

The world of numbers also has its palindromes For example, the number 121 is palindromic It is also a perfect square Another number that is both palindromic and a perfect square is 484 the square of 22 However both these numbers have an *odd* number of digits Can you discover the lowest palindromic square that has an *even* number of digits?

Solution to Puzzle No 33

The next three numbers above 50 which can be expressed as the sum of two squares in two different ways are

$65 = 1^2 + 8^2 = 4^2 + 7^2$
$85 = 2^2 + 9^2 = 6^2 + 7^2$ and
$125 = 2^2 + 11^2 = 5^2 + 10^2$

In the program the value *N* is tested by subtracting from it all smaller squares The remainder is then tested to see if it is a perfect square If this is the case, a further check is made to find whether there is a second set of squares

```
10 LET C = 0 30 LET N = 10 30 FOR A = 1 TO INT (SQR(N/2)) + 0.5 40 LET M = N - (A * A) 50 LET M = SQR M 60 LET M = VAL STR$ M 70 IF M - INT M <> 0 THEN GOTO 170 80 FOR B = A + 1 TO INT(SQR(N/2)) + 0.5 90 LET P = N - (B * B) 100 LET P = SQR P 110 LET P = VAL STR$ P 120 IF P - INT P <> 0 THEN GOTO 160 130 PRINT A SQ + M SQ - B SQ + P SQ = N 140 LET C = C + 1 150 IF C = 4 THEN STOP 160 NEXT B 170 NEXT A 180 LET N = N + 1 190 GOTO 30
```

Winner of Puzzle No 32

The winner is B Beesley Greens Close Bishopstoke Eastleigh Hants who receives £10

